

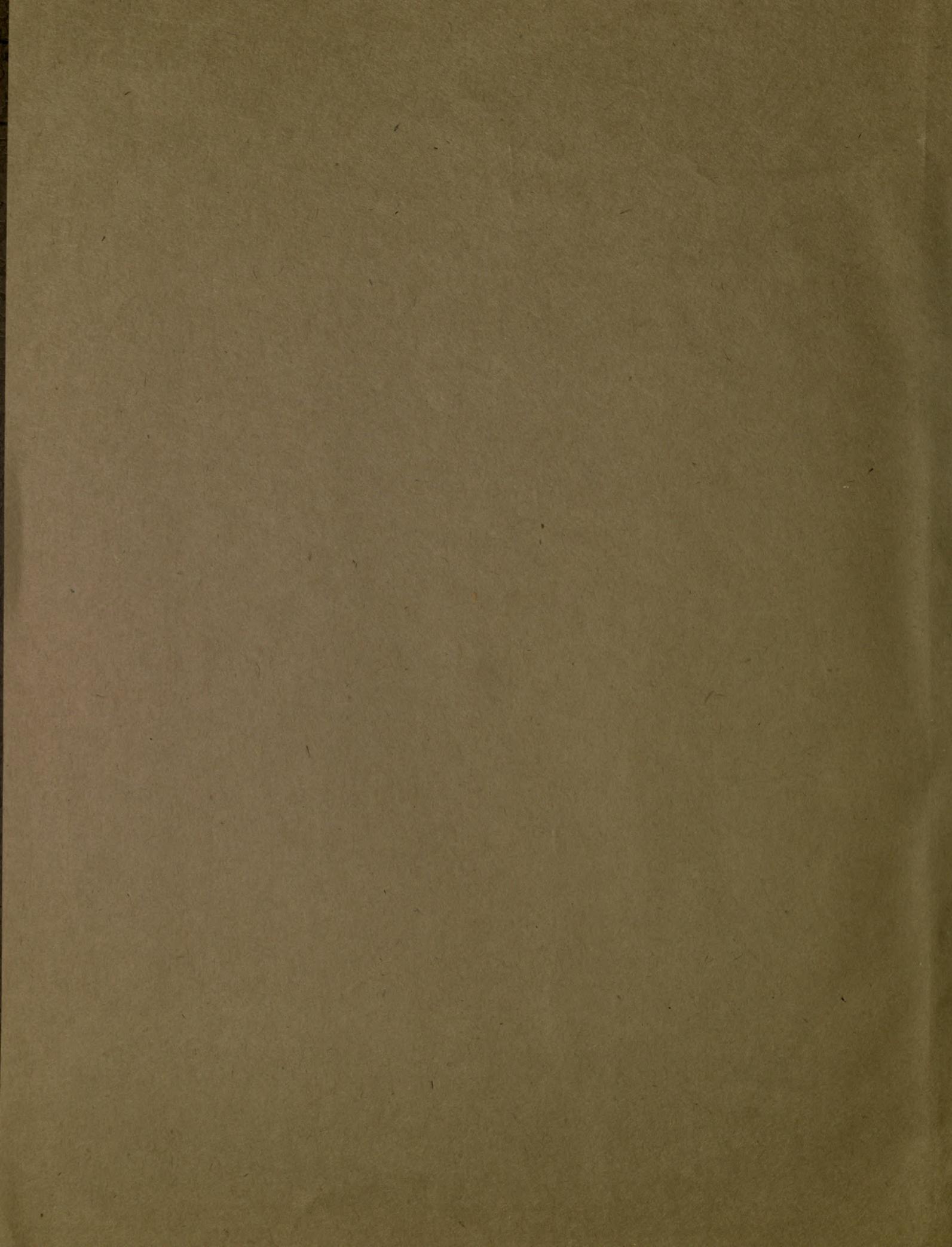
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FROM TREE TO TRADE

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LongBell

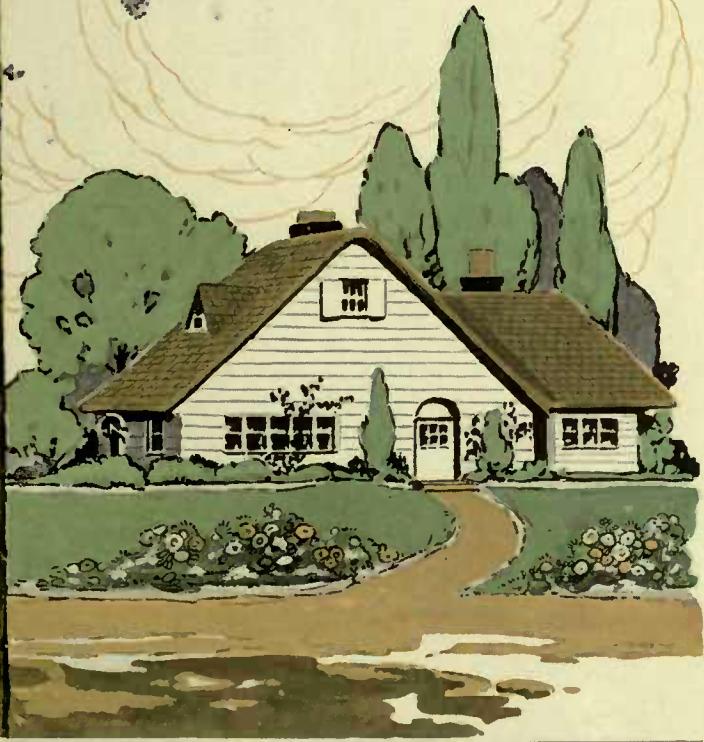
THE MARK ON QUALITY LUMBER

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FORESTRY

COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

From Tree to Trade



The Long-Bell Lumber Company
R. A. LONG BUILDING Lumbermen since 1875 KANSAS CITY, MO.



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In a Southern Pine Forest. This view, taken in the Cacassieu District of southwestern Louisiana, shows a typical stand of timber in a region that is remarkable for the size, height and symmetry of the trees produced there.



The Forest's Part in Nation Building

IT IS a moving spectacle to see a great tree, severed by the woodsmen, fall crashing to the earth.

Everyone, it is to be supposed, loves trees. And there is something tragic, as well as thrilling, in the downfall of a giant of the forest which for centuries, perhaps, has withstood the buffettings of winter's blasts and summer's tempests, ever growing in strength and stature with the struggle for existence, only to be laid low finally by the axe or the saw. It is this sentiment that moves us to regret—and occasionally protest—the felling of trees for commercial uses.

It so happens, however, that forest products are indispensable to mankind, and the intelligent manufacture of trees into useful forms is a service vital to civilization. Furthermore, forests may be so situated, or their areas so vast, that they are a hindrance, rather than an aid, to a country's development. It would be difficult to conceive of the American Continent being settled and civilized without the removal of portions of the forests, and the nation's greatness in agriculture has been possible only through the sacrifice of innumerable trees, often destroyed to the sole end of clearing the land upon which they stood.

In a utilitarian sense, a forest unused is a forest useless to mankind. Trees are a vegetable crop, and like others of their kind, they grow to maturity, decay, and die—a total loss unless they are harvested at the proper time and converted to the uses for which they may best be adapted.

The forests of America were at one time formidable and forbidding wildernesses. The pioneering homeseeker was compelled to labor long and patiently to effect a "clearing" for the cultivation of farm crops—and for many years thereafter maintain a constant battle to prevent the re-encroachment of the wilderness upon his reclaimed area. He was able to convert to useful ends very few of the trees he chopped down—his purpose was to destroy

them in the quickest and most effective manner possible. The commercial lumberman, on the contrary, has felled trees for the purpose of utilizing every portion of them that could be manufactured into useful forms; and in his operations the lumberman has saved the farmer a prodigious amount of labor in removing trees from millions of acres of land most useful for agricultural production.

The manufacture of lumber has attained the rank of the second largest manufacturing industry in America, because forest products—wood in all its countless forms—are absolutely essential to our daily life. Wood for shelter, wood for fuel, wood for implements and weapons, wood for furniture, wood for vehicles of transportation on land and water—every moment of our lives, from the cradle to the grave, we are using necessities or conveniences of wood. From lead pencils to dwellings, from matches to railroad trestles, from toothpicks to giant factories, from shoe-pegs to ships, wood is constantly ministering to our needs.

It is impossible for the human mind to comprehend the magnitude of the lumber industry today. Only a vague understanding is conveyed by the statement that the total production of lumber in this country amounts to nearly 40,000,000,000 board feet annually—approximately 1,600,000 capacity carloads. Of this stupendous quantity of lumber, something like 15,000,000,000 board feet, or 660,000 carloads, is of one variety alone—Southern Pine, the most useful and most adaptable of woods. One-third of the total population of the South is directly or indirectly employed in the production and merchandising of Southern Pine lumber, and 5,400 sawmills were engaged in manufacturing that material last year. In addition to some 30,000 sawmills in the United States engaged in converting the raw material—sawlogs—into various forms, there are more than seventy-five thousand kindred industries employed in converting sawmill products into more highly manufactured articles for innumerable uses.



Modernizing a Great Industry

LHE American lumberman, intrepid pioneer in the fullest sense of the term, has been a tremendous force in hastening industrial expansion and development. He has penetrated the forest wildernesses, remote and uninhabited, and has converted them into community centers and highways of traffic. He has hewn out roads, built railways, opened up waterways to navigation, constructed towns and cities, developed latent natural resources, and peopled the greater part of states with thriving, prosperous residents. He has opened up extensive sections to varied agricultural and commercial development, and has supplied all the conveniences for transportation and trade, the lack of which is the most formidable hardship of pioneering in "new" countries.

The methods employed in lumbering operations vary with differences of topography and climate, but everywhere in America the industry has been thoroughly "modernized." Improvements over primitive methods of early days have been made in all branches of the industry, and every year new mechanical devices are adopted to increase efficiency of production and to save waste. The modern lumber manufacturing plant includes an enormous amount of ponderous machinery and other equipment, as well as housing facilities for many hundreds of employees, and represents an investment of capital, aside from the cost of standing timber, that frequently runs into the millions. In Southern Pine lumbering operations, logs are transported from the woods to the sawmill by steam railway, and as branches and spurs of these logging roads are constantly being shifted, the lumberman's railroad building activities never end. Logging camps, established in the depths of the forest and frequently providing living quarters for several hundred woodsmen and their families, also must be shifted to keep pace with the woods operations—a task as formidable in its entirety as moving bodily a good sized village. The business of lumbering as it is carried on today in the Southern Pine forests is, in fact, an impressive demonstration

of man's ingenuity in adapting powerful mechanical forces to his daily need of mastering difficulties and handling extremely heavy, bulky and clumsy materials rapidly and effectively.

Lumbering was the first American industry, for the very good reason that the colonists were compelled to cut down trees from which to build themselves shelter. Forest products also were among the first materials exported from this country, as there was an immediate demand from England for material for shipbuilding, especially masts and spars cut from the towering pines that abounded along the New England coast. In those early days trees were felled with axes and split and worked into rough lumber with the same or similar implements, because saws were scarce and hard to get. Our forefathers evolved and improvised logging and wood-working devices as necessity demanded—they had no precedent to guide them, for the reason there were no such things as sawmills in England, and the colonists had no knowledge of them. Then, and since until recent years, logs were hauled from the woods by horse power or by slow plodding oxen. Lumber had absolutely no value then, except that represented in the labor of producing it. For many years the Virginia colonists esteemed the imported, hand-wrought nails, used in building their homes, of more value than the wood with which the dwellings were framed. It became the general custom when a colonist moved from one locality to another, for him to burn his house in order to salvage the nails for the construction of another. This practice became so destructive to houses in the older established communities that a law was passed, providing that, when a resident determined to move, a board of appraisers should estimate the quantity and value of the nails in his house and that he be compensated for these, so that he would not destroy his old dwelling.

The necessity for quantity production, economy of operations, closer utilization of all useful portions of trees, and for transporting sawlogs long distances overland to the mills,



all have had a part in developing remarkable mechanical aids to lumber manufacture. Today trees still are felled by hand, because two men equipped with a crosscut saw have proved the most effective and economical combination for that work. In Southern Pine forests the woodsman's axe is an obsolete implement, except for notching trees and trimming the fallen trunks. Railroad spurs penetrate to the remotest depths of the forests, and on these giant steam skidders are brought to the scene of the logging operations. The skidders are equipped with long cables attached to drums, and these cables, armed with steel tongs, reach hundreds of feet into the woods, seize the fallen trunks and yank them swiftly to the side of the railroad; there to be seized by steam loaders, hoisted whirling into the air and piled neatly and securely on cars placed to receive them. As each car is loaded to capacity it makes way for another, and when a train load is made up they are hauled away to the mill, ending their journey in the mill pond. In contrast to the primitive methods of early days, the mechanical equipment today is such that the sawlog is scarcely "touched by human hands" from the standing tree until it has been worked into the rougher forms of lumber by the great band saws in the mills. So rapid and so efficient are the methods of handling and the processes of manufacture now that a modern sawmill may produce hundreds of thousands of board feet of lumber, worked into a multitude of forms, every working day in the year, and standing trees may be felled, trimmed, loaded, hauled twenty miles or more to the mill, and converted into highly finished products, all within the space of a few hours.

The interior of a well equipped sawmill is a roaring maelstrom of ponderous and intricate machinery, moving at tremendous speed, and controlled and directed by a swarm of workmen, each highly skilled in his allotted task. From the second that the great sawlogs enter the mill via an endless chain conveyor and take their initial plunge into the teeth of the

singing band saws, the journey never halts until the logs, transformed into various sizes and shapes of building material, are delivered on the docks for stacking in the yards or more rapid seasoning in the dry kilns. Utilization of the material in the log has reached the point where there is very little left of commercial value. Bark, sawdust and edgings trimmed from boards supply the fuel required to produce steam power for the mill machinery, and in some instances when this waste material exceeds the fuel requirements, it is subjected to distillation for the extraction of turpentine and pine oils, or converted into pulp for the manufacture of paper and container board.

The unavoidable waste of raw material in the manufacture of lumber has always been most pronounced in the forest. There is still waste there, and there always will be until the consumers of forest products will accept material that can be made from this waste and in such quantity as to justify its conservation. While to the casual observer the tree tops left in the woods might seem wanton waste, to the lumberman they are reluctantly relinquished portions of his property, sacrificed to freight rates and lack of market; the lumberman is too good a business man to deliberately abandon material that might be utilized at a profit, or even at cost. As it is all waste is being eliminated as rapidly as possible. Time was when the lumberman placed so little value on standing timber and was limited to such primitive and crude devices for the manufacture of lumber that he attempted to utilize only the choicest portions of the best trees, frequently felling many that he later deemed unworthy of making any use of whatever. Today the lumberman has the keenest appreciation of the value of the tree, and equipped with a great variety of marvelously efficient machinery, he strives constantly to devise new means of utilizing even the most insignificant portions of the trees he fells.





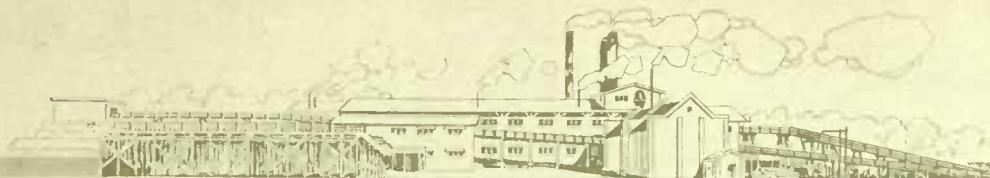
Community Life in the Lumber Industry

HE manufacture of lumber differs from other great industries in that it is carried on in localities remote from centers of population. Forest areas of sufficient size to warrant lumber operations involving the initial investment of millions of dollars are naturally in regions sparsely inhabited, so the lumberman is compelled to carry there not only all of the mechanical equipment required, but to provide all the necessities of life for himself and the thousands of workers he must have about him. That necessity has resulted in some amazing feats of community development, particularly in the South. In the great forest areas of the

southern states there have been scores of instances where timbered wildernesses have been transformed almost over night into populous cities, substantial, attractive, and equipped with all the utilities and conveniences of modern life. These are not "mushroom" growths in any sense except that of their sudden development, but are in fact permanent additions to the country's urban communities. They are made up of comfortable homes, good stores and well designed public buildings, churches, hospitals and schools, fairly representative of the best type of American population centers. When the lumber industry has ceased to be of dominant importance in these



These pictures show types of workmen's homes at Long-Bell mill towns and logging camps.



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communities they will be amply sustained from other sources, and, because of their very size and importance, will have hastened the agricultural development of the surrounding country made available by the operations of the lumberman. While many of these towns and cities in the South today have already outgrown a condition of dependence on the lumber industry and are peopled by a forward-looking citizenry, fully capable of creating and conducting independent industries, they nevertheless must always remain monuments to the pioneering spirit and enterprise of the lumberman.

It appears that people, not houses, make cities. The largest and most pretentious assemblage of dwellings and other structures, if uninhabited, soon would be in effect a desert, whereas the chosen abiding place of a thousand or so men, women and children quickly takes

on all the physical and social aspects of a city. Sawmills have been the nucleus of some of the most prosperous and progressive communities of the South, and those who dwell in "sawmill towns," whether or not their livelihood is derived from the manufacture of lumber, are fully as contented and comfortable as their brethren who live in older centers of more obscure origin. As a matter of fact, one of the best evidences of general community well-being in southern sawmill towns is that they always have been singularly free from industrial disturbances and from the perpetual labor "turnover" which burdens industry elsewhere. There are fewer of the "drifter" type of workmen in the southern lumber industry, probably, than anywhere else in the country, and a large percentage of the employees of the large mills are men who have been with the same companies from five to twenty years.

Life in Logging Camps

THE old time logging camp of the north woods was a mere group of rough shacks—one or more bunk houses, a cook and dining shack, a shelter for horses, one about as bad as the others. There was no attempt at comfort, sanita-

tion, or facilities for physical or mental recreation. And the woodsmen who occupied these camps were fully as rough and uncouth as their habitations—hard working, hard fighting, hard drinking, semi-lawless characters, many of whom toiled for months to the sole



Y. M. C. A. at Bonami, Louisiana.



end of accumulating money sufficient for a prolonged spree at the finish. Logging operations then were carried on there for the most part during the winter season, in a bitterly cold climate; the work was a severe tax on the strength of the most powerful men, and none was expected to brave the hardships and privations unless he was of exceptionally tough fibre.

A similar indifference to the worker's welfare at one time characterized southern lumber camps. The mild climate permitted logging operations to continue throughout the year, and there was no bitter cold to be endured, but there was pretty much the same condition otherwise. That, however, is a condition that exists no longer. Lumbermen, like other large employers of labor, discovered long since that social welfare, cleanly personal habits, healthful diversion—mental, moral and physical well-being—are essential to highest efficiency and stability in a force of workers.

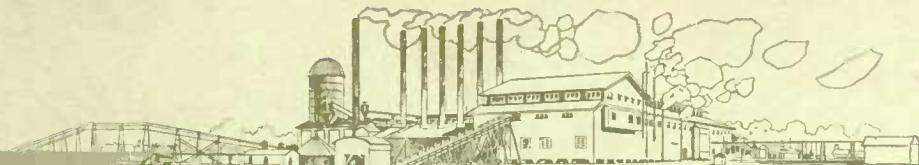
The typical southern logging camp today, though it may be twenty miles or more from an established town and subject to being removed at any time, more nearly resembles a staid and eminently respectable village than it does the camp of early days. These camps, formerly jumbled together without regard to arrangement or order, and inhabited by men only, now are laid out according to orderly plan, are neat and clean, and women and

children are as numerous as in any permanent settlement of like population. The inhabitants frequently number hundreds, and while the dwellings they occupy are sectional houses and portable, they are comfortable and home-like. There are electric lights, telephones, shower baths, daily mail service, stores, schools, a public library, and community centers where there are club rooms, an auditorium for church services, motion picture shows and other public gatherings. The isolation of these workers, living under healthful and wholesome conditions, has fostered the community spirit to a degree where any disturbing element of disorder or lawlessness would be instantly suppressed by unanimous action. A police force is not necessary for these temporary "towns" in the depths of the forests—every man dweller in them is a volunteer policeman on his own account, vigilant to maintain the serenity of his community. Of healthful recreation there is plenty, community interests are everybody's interests, and the net result is contentment, good health, and a uniform condition of industrial harmony. Instead of being an existence lonely, monotonous and full of hardship, life in the model lumber camp today—and most of them are models—is such that the inclination to seek diversion elsewhere is less pronounced than in the average established town lying within reasonably easy reach of a large city.

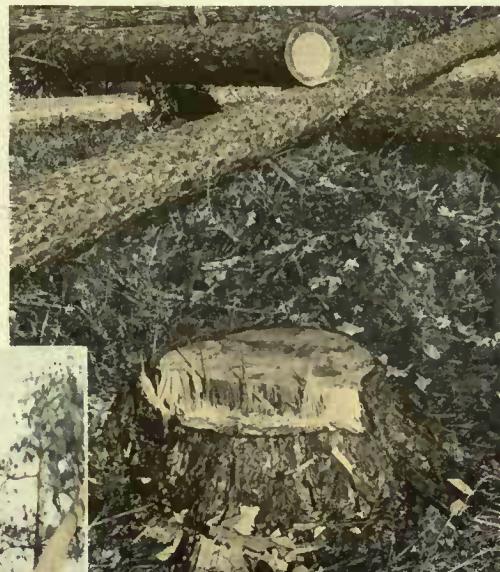
Lumber in the Making

THE appraising eye of the lumberman sees in standing trees many qualities that are hidden from the casual observer, and it is this ability to judge that guides him in choosing the field of his forest operations. Density of growth, the frequency with which high winds may visit a certain locality, climate and soil—all have an influence on the structure of wood in trees, and all these conditions are considered by the lumberman before he begins operations for the manufacture of lumber. When trees stand uniformly upright with few leaning from the perpendicular, and with dead branches

remaining on the tree, the lumberman knows high winds are rare and, because of the dead limbs remaining in place, the lumber made from such trees will be knotty. In the great Southern Pine forest the trees that grow in stiff, compact earth are in their structure harder, heavier and more pitchy than trees which grow in loose, sandy soil, because the firm earth holds the tree roots rigidly and the trees sway and bend above the stump when disturbed by winds. The denser the growth of pines, the fewer the branches on the trees, because the growth energy under such con-



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Southern Pine tree trunks.
Low cut stumps save waste.
Showing the bending strength of Southern Pine.

The falling tree.

Stump, butt and length of log.
Illustrating the tensile strength of
Southern Pine.

ditions is expended principally in the struggle to reach upward to the sunlight.

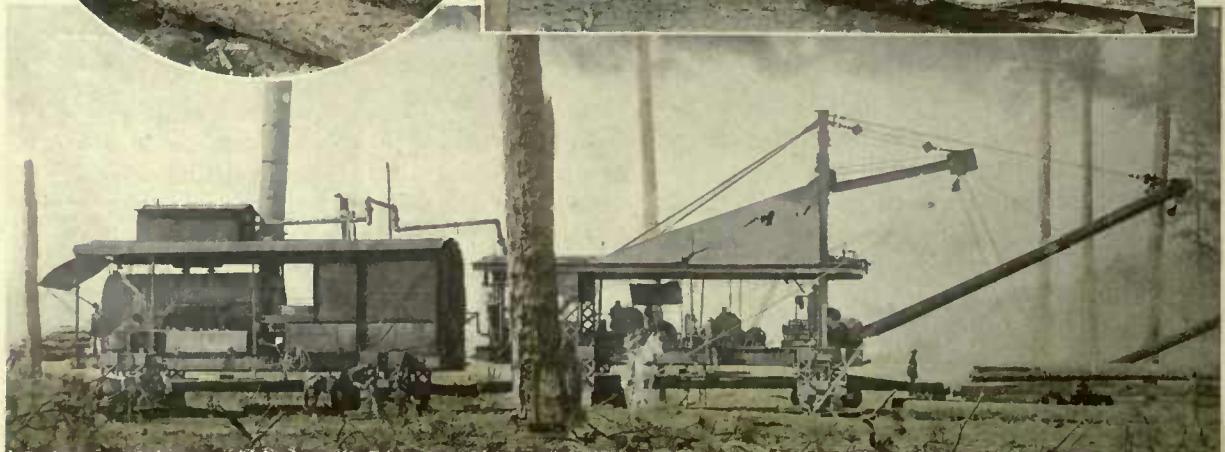
The first step in extensive lumbering operations is to build a railroad from the saw-mill into the timber, this serving as a main line to which spurs and lateral lines will be joined as the work progresses. The main line is of more or less "permanent" construction, but the lines running from this artery are constantly being shifted, so that in "logging"

Southern Pine forests railroad lines are constantly being torn up and relaid.

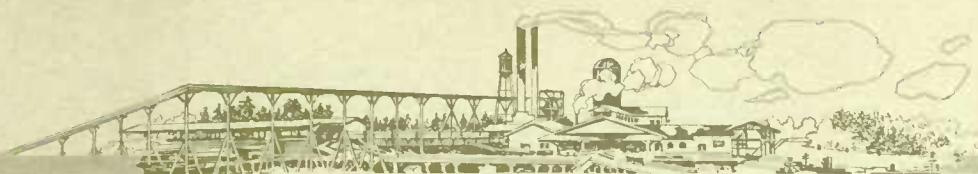
After the railroad builders come the logging crews, the workmen who actually fell the trees and assemble them for their journey to the mill. The log cutters work in pairs, a right-handed and a left-handed man in each pair. The implements with which they work are a cross-cut saw, an axe, an assortment of thin wooden wedges, and a bottle of kerosene with



which to oil the saw. The trees are first "notched" on the side toward which they are to fall, that the tree may not split as it starts to descend. That done, the saw is started into the tree on the opposite side. If the tree settles in its position and "pinches" the saw,



Mechanical equipment is employed in modern logging operations. These views show steam skidders and loaders assembling the fallen logs and loading them on cars; also a type of woods locomotive.



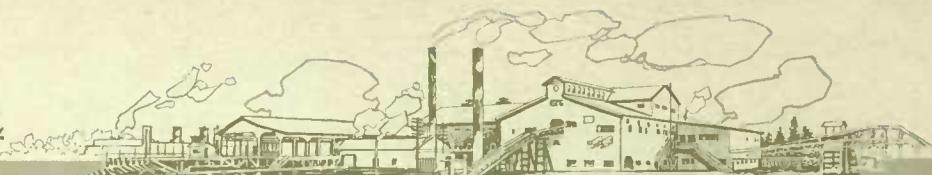
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the wedges are introduced to relieve the pressure, and the sawing continues until the tree is severed and crashes to the ground. The giant trunks, comparatively free of limbs, produce a peculiar and far-reaching sound as they strike the earth—a resonant and sonorous “boom,” like the muffled report of a cannon shot far away. When a large gang of loggers is cutting down trees the incessant “boom-boom” of the falling trunks, rever-



Logs beginning their journey to the sawmill. Above, logs assembled for loading; below, a 4-line skidder and loader handling logs at the rate of seventy million feet a year.



berating through the forest aisles, is more suggestive of a distant battle than of the progress of a peaceful industry.

The log cutters trim the branches from the fallen trunks with the axe, and saw off the small tops. Frequently the long main trunk is sawed into two or more lengths, according to requirements for the class of material being manufactured at the mill.

Hard upon the heels of the log cutters comes the skidding and loading crew. Methods differ in this work, according to the topography of the country, the class of timber and density of undergrowth, but the most economical and most efficient operation is to assemble and load the logs by machinery. Frequently one ponderous machine, a combined skidder and loader, which "straddles" the logging railway, supplies the power for both operations. Long steel skidder cables, with "grabs" like ice-tongs attached, are hauled from the skidder to the fallen logs by stout horses, ridden by boys; or by the most modern method, the cables are steam-hauled on trolleys by what is known as the "re-haul." The grab is attached to a fallen log by a "grab setter," a signal is passed to the operator known as the "drum puller" on the skidder, and as the steam power is applied a drum or winch reels in the cable and the log races to the side of the skidder. There the logs are seized by a cable from a loading boom, hoisted into the air, and deposited

on log cars set to receive them. As each car is loaded to capacity it is pulled forward to make way for an empty car, the operation being repeated until a train load of logs is made up.

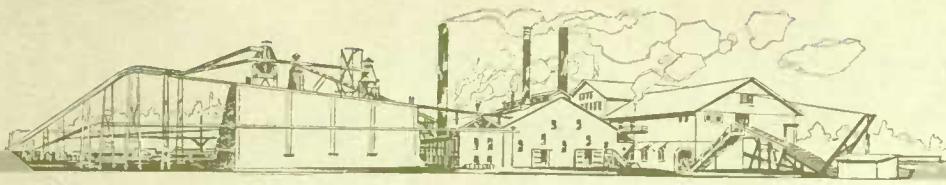
Prosy description can give little idea of the spectacular and strenuous activity of logging forces at work in the woods. Horses and men rushing to and fro, seemingly in constant and imminent peril from falling trees; giant logs, with skidder cables attached, plunging through the undergrowth on their way to the skidder, there to be tossed into the air and whirled dexterously into place on the log cars; the "boom-boom" of falling trees, the roar of steam exhausts, engines puffing, workmen shouting warnings and instructions—all contribute to a medley that makes the forest seethe with motion and resound with a confusion of noises.

When train loads of logs hauled from the woods reach the mill, possibly twenty miles or more distant, they are automatically dumped into the mill pond. This pond is common to all Southern Pine sawmill plants, for the reason that logs can be handled, sorted and stored in water more economically than in any other way, and are there preserved against decay and injury from wood destroying insects while awaiting their final journey to the saws.

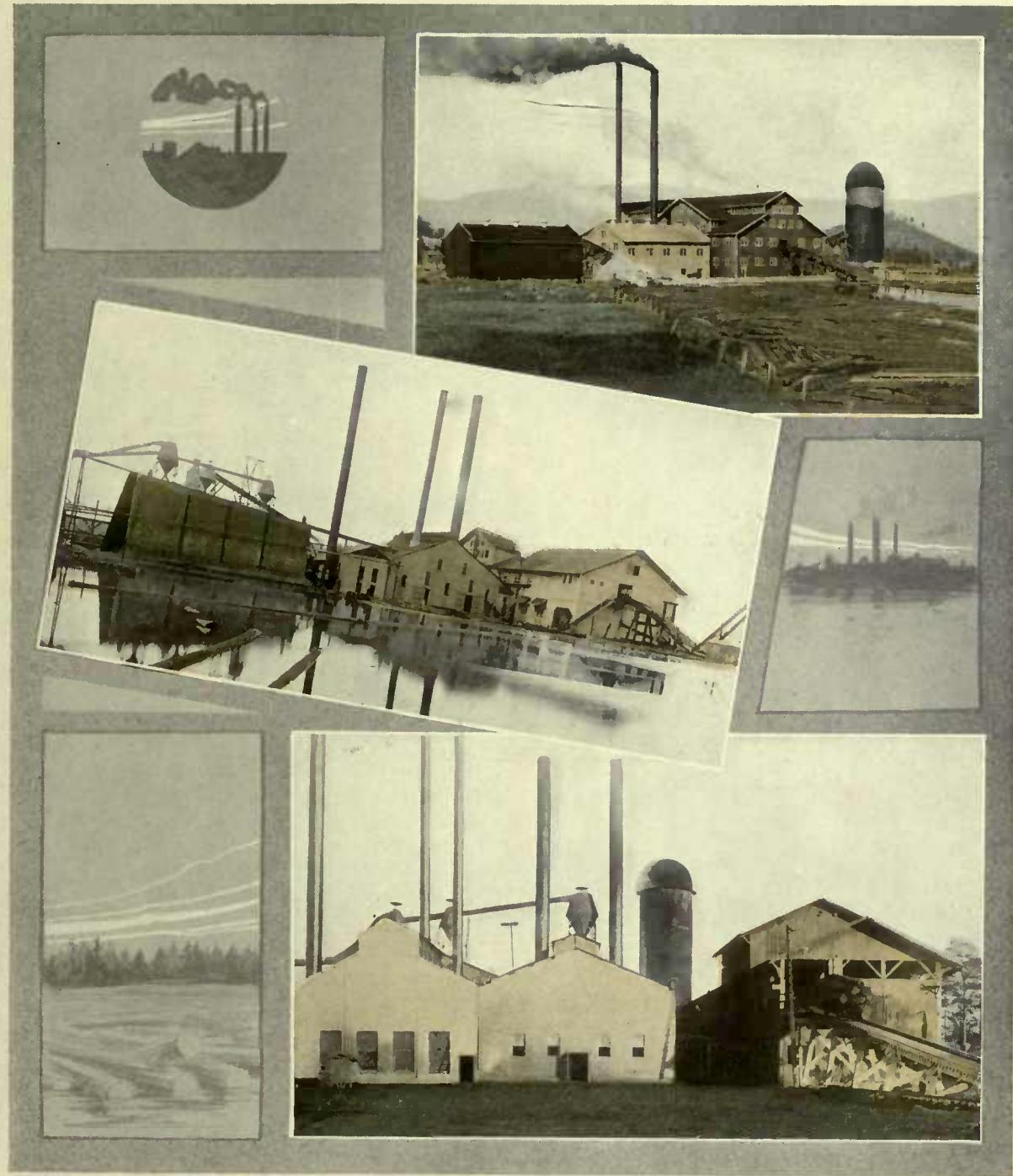
The logs make their entrance into the mill over an inclined chute equipped with an endless spiked chain conveyor. The logs are



A train of Southern Pine logs on the way to the sawmill.



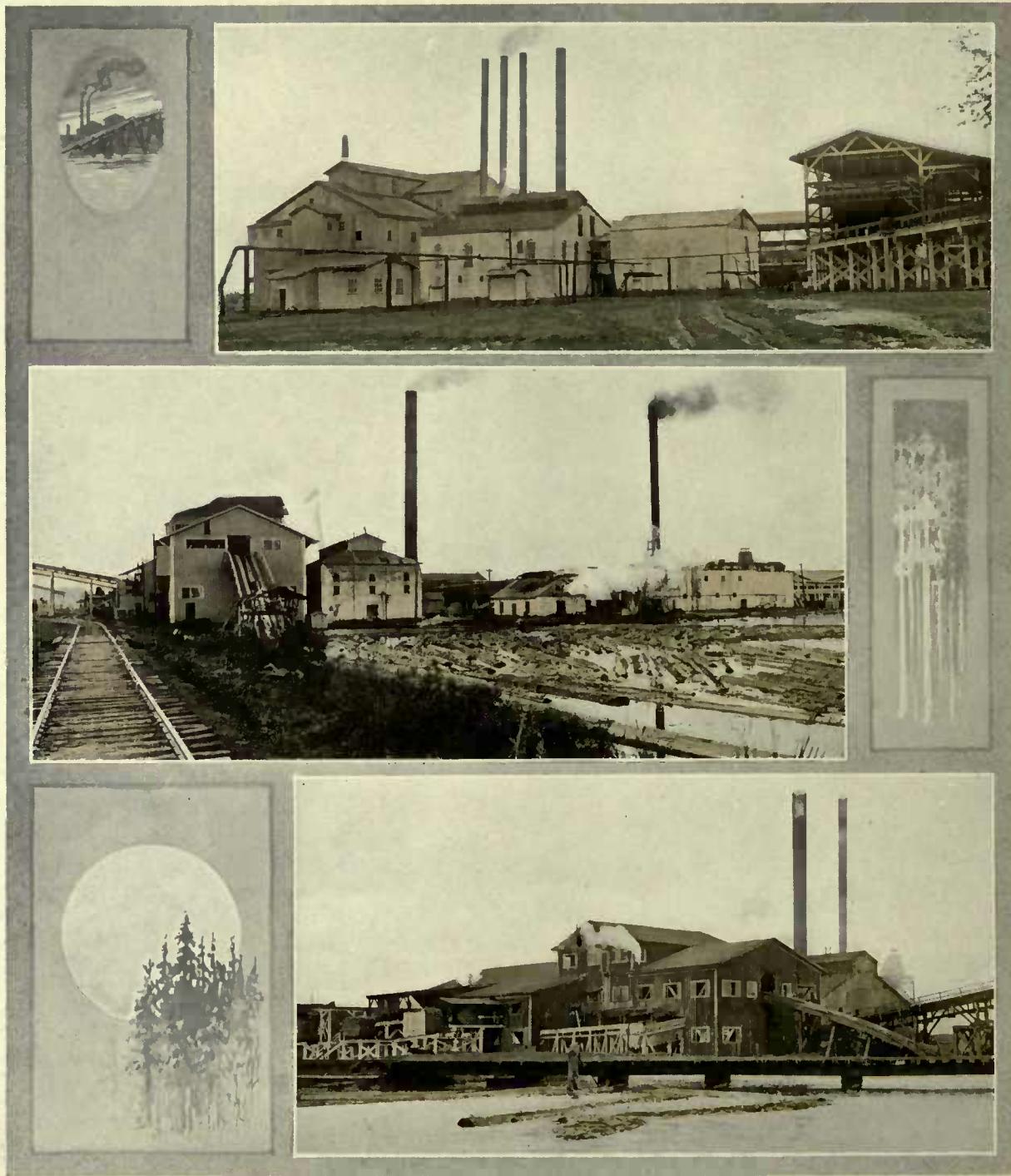
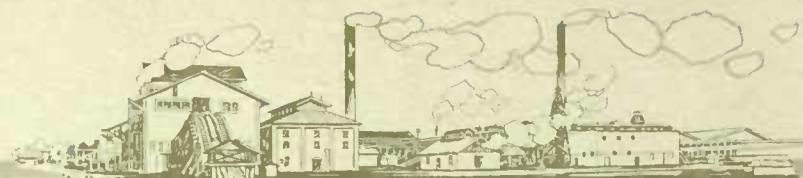
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Sawmill Plants of The Long-Bell Lumber Company.

(Top) California White Pine Plant, Weed, Calif. (Center) Southern Pine Plant, Ludington, La.
(Bottom) Hardwood Plant, Pine Bluff, Ark.

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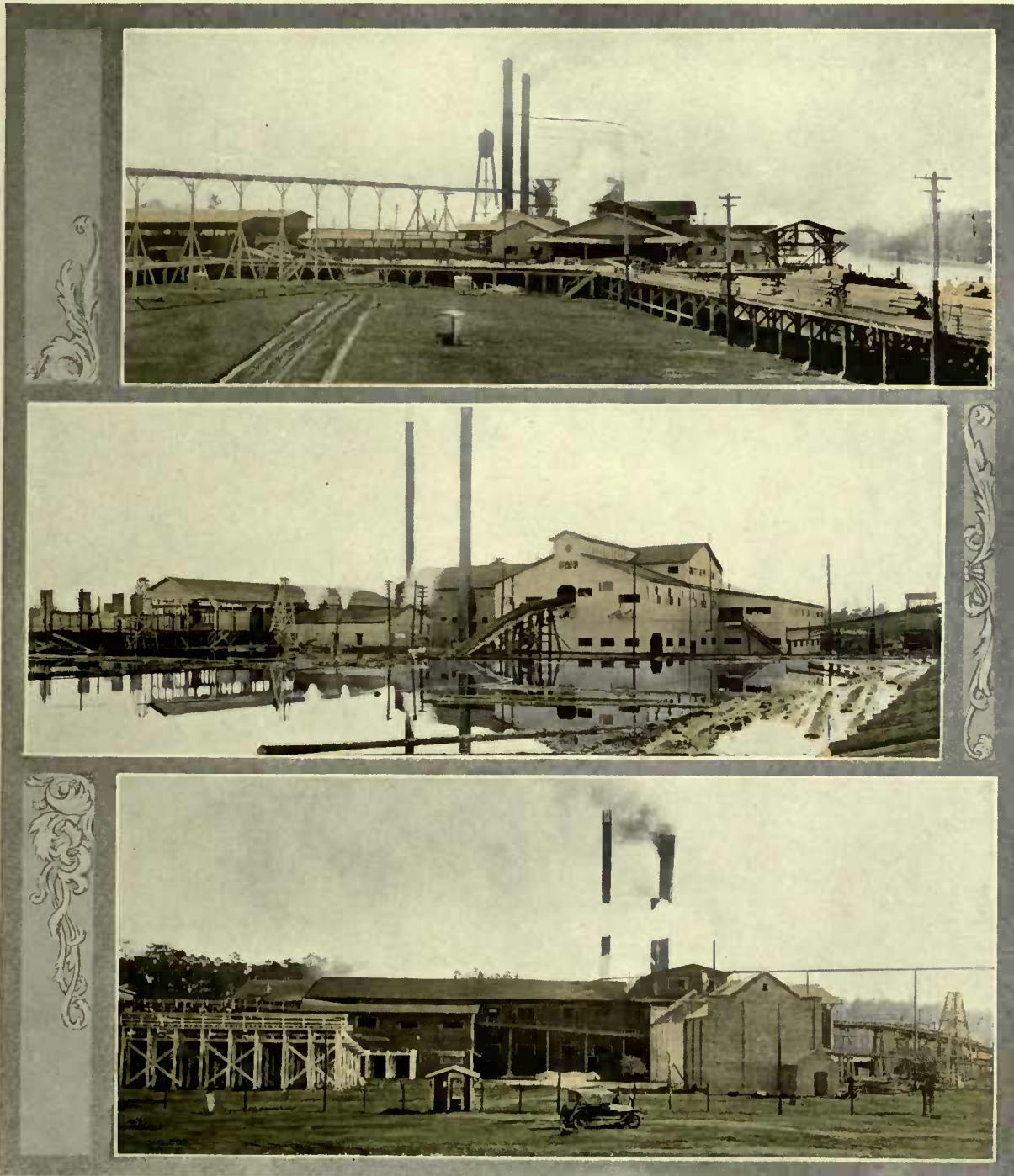


Sawmill Plants of The Long-Bell Lumber Company.

(Top) Southern Pine Plant, Doucette, Texas. (Center) Southern Pine Plant, DeRidder, La.
(Bottom) Southern Pine Plant, Woodworth, La.

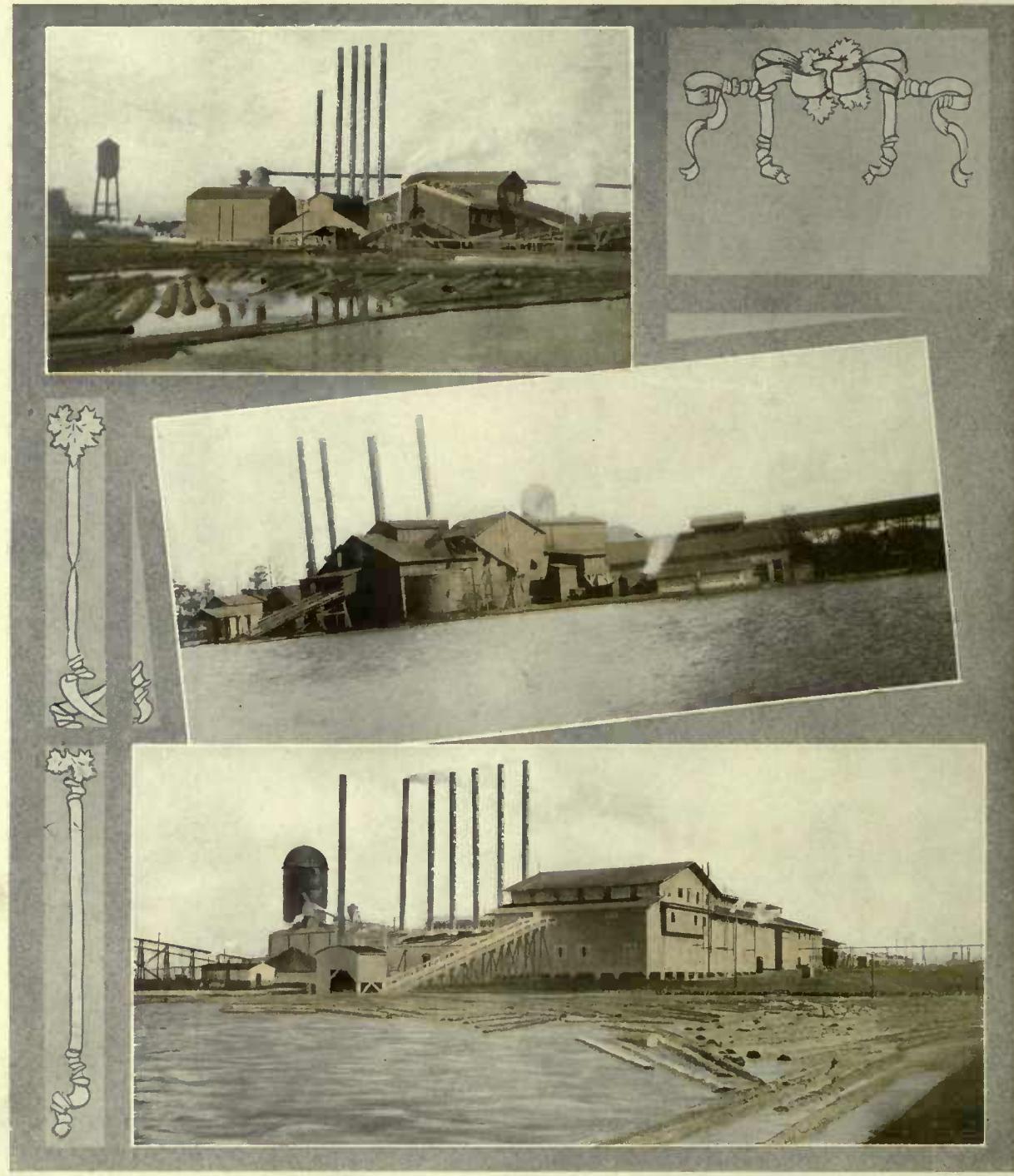


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Sawmill Plants of The Long-Bell Lumber Company.

(Top) Southern Pine Plant, Lake Charles, La. (Center) Southern Pine Plant, Quiltman, Miss.
(Bottom) Southern Pine Plant, Bonami, La.

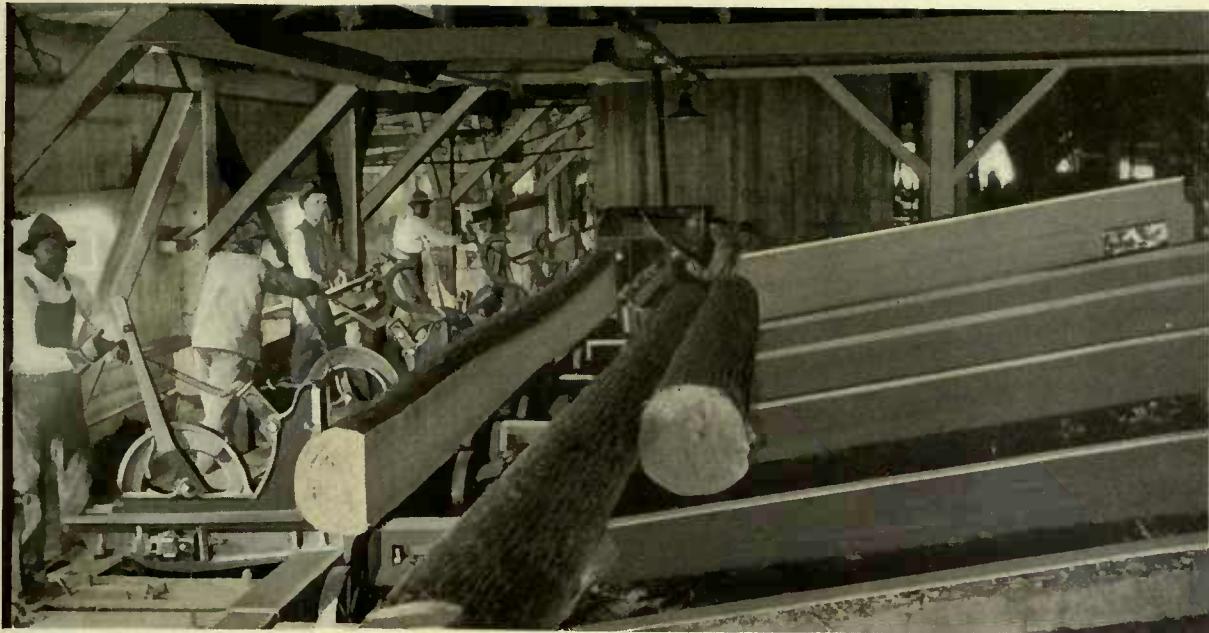


Sawmill Plants of The Long-Bell Lumber Company.

(Top) Southern Pine Plant, Lufkin, Texas. (Center) Shortleaf Southern Pine and Gum Plant, Pine Bluff, Ark.
(Bottom) Southern Pine Plant, Longville, La.



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The log carriage, which carries the logs to the band saw, is a ponderous piece of mechanical equipment, spectacular in its operation. The carriage is manned by a crew of four to six workmen.

floated into place until one end is brought into contact with the conveyor, when they are caught by the chain spikes and lifted from the water and up the chute. As they enter upon the "log deck" inside the mill they pass under the inspection of a scaler and deck-saw man, skilled in judging the size and quality of the logs and their fitness for conversion into certain forms of lumber. If a log chance to be of very large size, free from imperfections and dense in its structural fibre, the deck-sawyer may permit it to pass on its way, to be squared and dressed into a great timber suitable for use in heavy construction. If it might better serve some other purpose, the deck-sawyer halts the progress of the log, and with the pressure of a lever a giant circular saw descends, cutting the log in two with the speed and seeming ease of a knife cleaving new cheese. From the log deck the log or each of its sections is "kicked" by steam-driven steel arms onto a skidway, down which it rolls to a resting place in front of the band-saw carriage.

The band-saw, the carriage and all of the "rig" pertaining thereto are highly important

parts of sawmill equipment, under the control of one of the most important and highly skilled workmen in the mill—the sawyer. A good sawyer not only must know the anatomy of a tree and be able to judge it at a glance, but he must be extremely sensitive to the amount of force at his command, represented in the complex mass of powerful, steam-driven machinery he controls, and be able to divide his attention into three or four channels at the same time and all the time he is on duty. He directs and regulates the speed of the log carriage, using both hands and feet in applying and cutting off steam power; manipulates the log on the carriage as it travels to and from the saw; determines the size of every cut made from the log, and meanwhile is constantly "sizing-up" and classifying the log as cut after cut is removed—all simultaneously. A crew of three to six men ride on the log carriage and manipulate the "setting" device and the "dogs" which hold the log in place while it is



Southern Pine logs of exceptional size ready to go onto the carriage and be converted into timbers suitable for heavy construction.

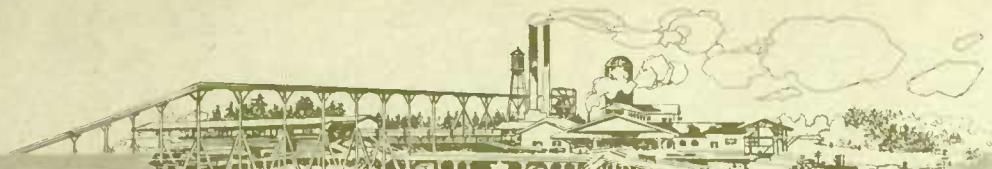
being sawed. These workmen take their orders from the sawyer, receiving them in the form of signals made with the fingers, since the incessant roar of ponderous machinery moving at top speed makes speech inaudible.

The log carriage moves to and from the band saw at a rate that makes riding upon it seem precarious work, requiring close attention to the business in hand, and at each trip a slab or plank is ripped from the log. The slabs, or outer cuts of the log, fall upon running rolls and are hurried to a machine called a slasher, which cuts them into four foot lengths for lath stock. Planks or boards cut from the log pass over conveyors to the edger, a machine which, at the direction of the operator, may merely trim the bark edges from the planks or may rip them into various combinations of widths. From the rear table of the edger the boards drop to conveyors which carry them to the trimmer, where they have faulty ends

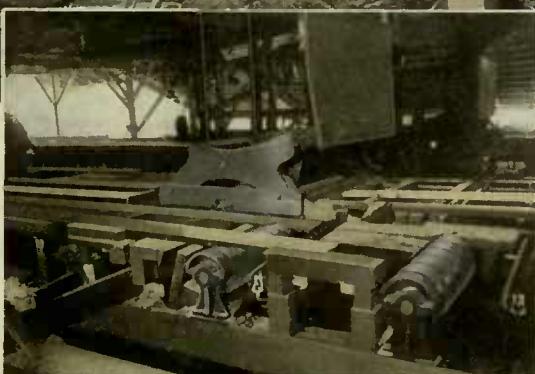
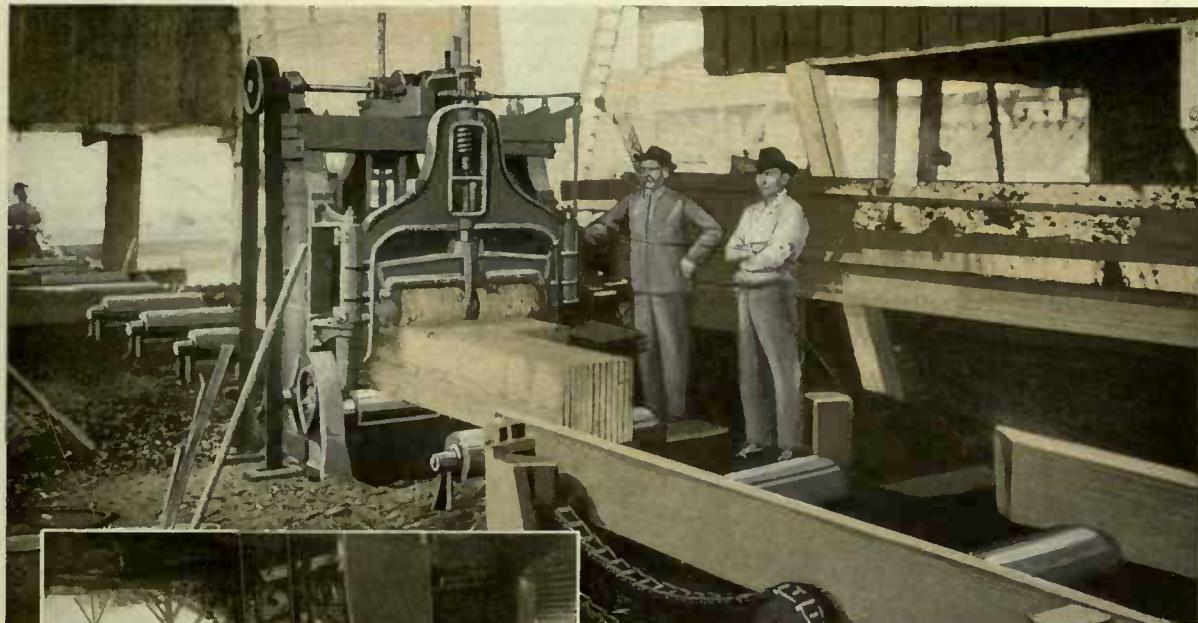
removed and defects cut out. This accomplished, the resulting product is finished rough green lumber, and the first important step in the manufacture of logs into building material is completed.

The portion of the lumber that is to be kiln dried drops into a conveyor on live rolls and is carried to the drop sorter, where it is automatically separated as to lengths, and is loaded on small trucks or kiln cars of about four thousand feet to the car, by which means it is conveyed to the dry kiln. The portion that is to be air dried drops from the trimmer into another conveyor on live rolls and is carried to a long sorting table, at which point it is separated as to grades and lengths, and loaded on trucks for conveying to the yard for drying.

When the sawyer in control of the band-saw decides that a log is best suited to manufacture into a structural timber, the log is merely

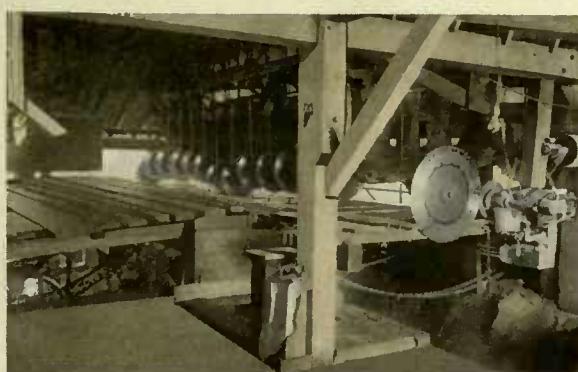


Long Bell



(Above) A gang saw, the machine which is used largely in the production of boards and light dimension.

(At Left) The edger, which removes the bark edges, and rips the stock to size.



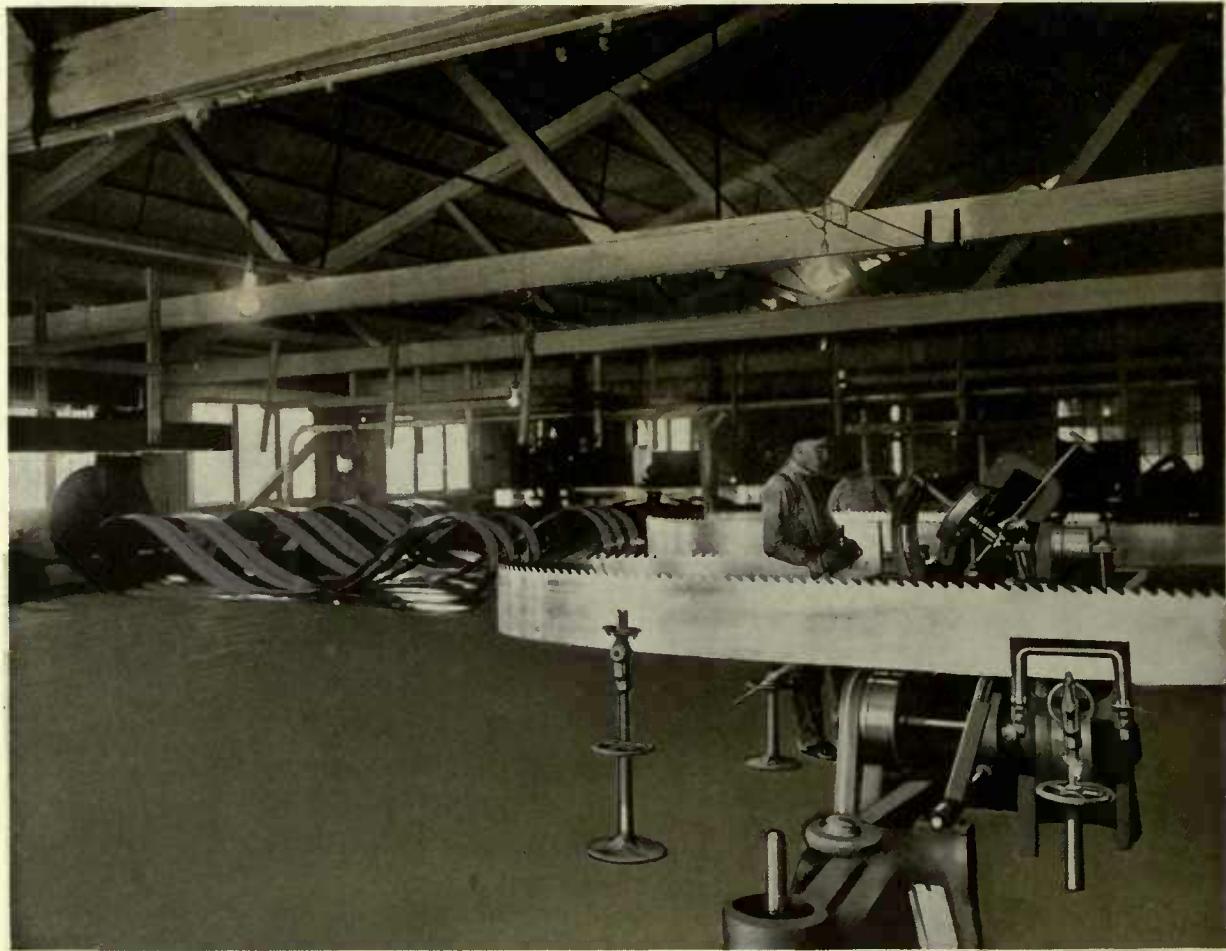
The trimmer, composed of many circular saws, which cut out knots and remove other defects.

stripped of slabs and squared up before it leaves the log carriage. These timbers are dropped upon live rolls and conveyed to the back end of the mill, where they are carefully trimmed to proper lengths and graded. From this point they pass to the timber dock and from there are loaded directly to railroad cars for shipment.

In other instances the log is squared and then sent to the gang saw, where it is converted into a number of boards at one operation. These boards pass over conveyors to the edger and from there follow the same course as the boards cut by the band-saw.

The better grades of Southern Pine lumber are usually kiln dried, and at some plants all the lumber products, except timbers, are so treated. The kiln drying is actually a rapid seasoning process by which the material is made fit for building use in from three to six days and as completely seasoned as can be done in the open air in many months.

The process of kiln drying lumber intended for manufacture into highly finished products is an operation requiring painstaking care in the regulation of heat and moisture. Safe limits of temperature and humidity differ widely for different kinds and thicknesses of wood. Valuable high grade material where joints, mortises, glued construction, re-sawing and shaping are involved must not only be free from check, splits and warping, but must be



A sawmill filing room where the great band and circular saws are sharpened by automatic machinery.

free from brittleness, case hardening and internal stresses, and therefore dried to a uniform moisture content. For uses in which the highest quality of material is not essential or desired, or when certain reduction in quality is permitted, somewhat different degrees of temperature and humidity are used to produce more rapid drying, according to the requirements and judgment of the operator.

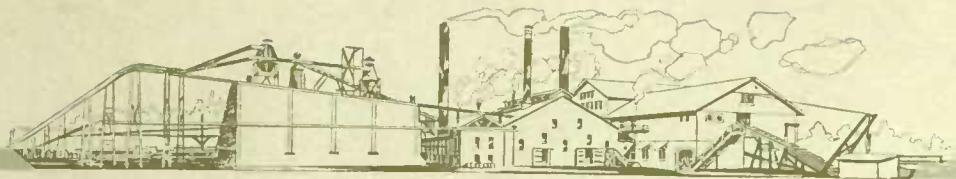
From the kilns the lumber is run into cooling sheds, where it is allowed to stand until the moisture content of the lumber has been equalized with that of the surrounding atmosphere. After this cooling process the lumber is removed from the kiln cars, assorted as to sizes and lengths, and is ready to be sent to rough sheds for storage, or to the planing mill for



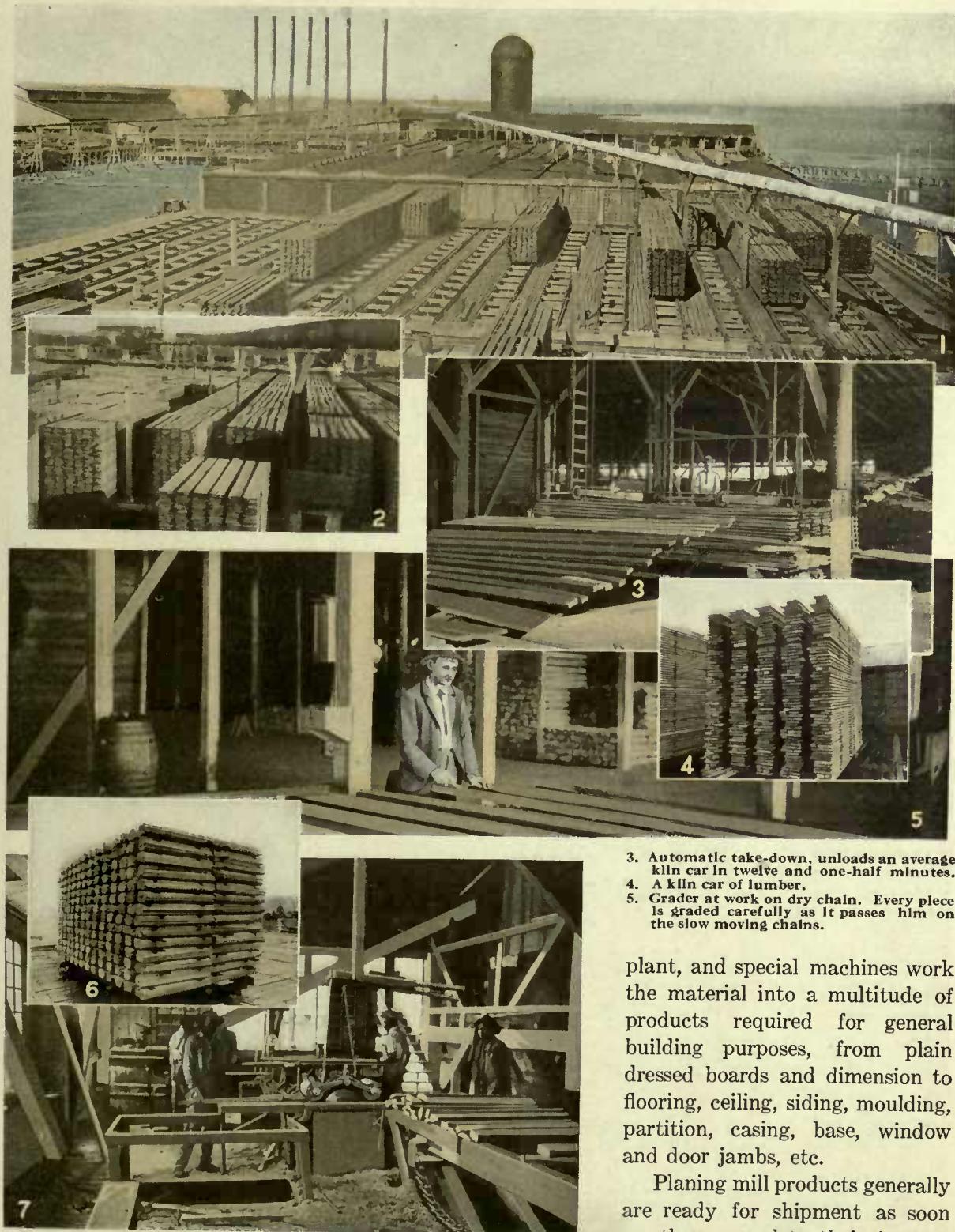
Soda dipping the common grades of air-dried lumber to prevent discoloration or sap stain.

manufacture into the finished forms for which it may be best suited.

The planing mill is an important and necessary part of a lumber manufacturing



Long-Bell



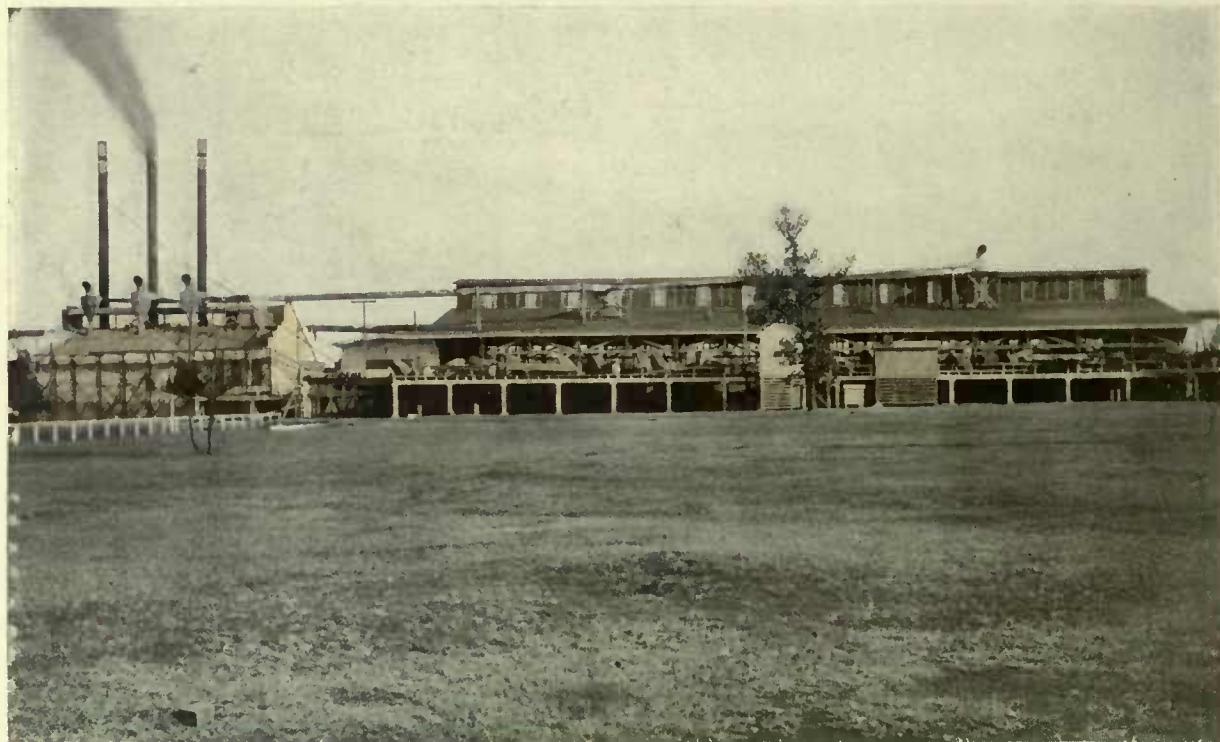
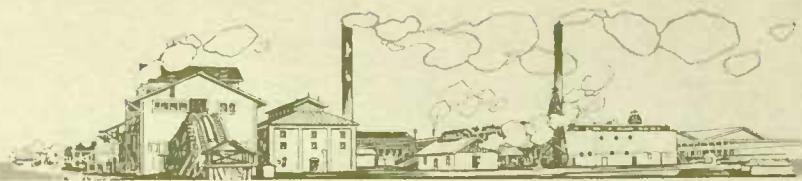
1. Dry Kilns. Lumber in the foreground that has been in the kiln from 72 to 96 hours. 2. Lumber ready for kilns. 6. Kiln car of lath.
7. Lath mill. Slabs on conveyor chain show class of material saved from waste by being made into lath.

3. Automatic take-down, unloads an average kiln car in twelve and one-half minutes.
4. A kiln car of lumber.
5. Grader at work on dry chain. Every piece is graded carefully as it passes him on the slow moving chains.

plant, and special machines work the material into a multitude of products required for general building purposes, from plain dressed boards and dimension to flooring, ceiling, siding, moulding, partition, casing, base, window and door jambs, etc.

Planing mill products generally are ready for shipment as soon as they complete their journey through the mill, and usually are loaded on cars direct.

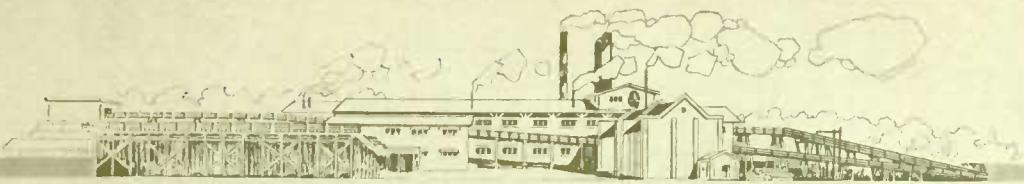
Long Bell



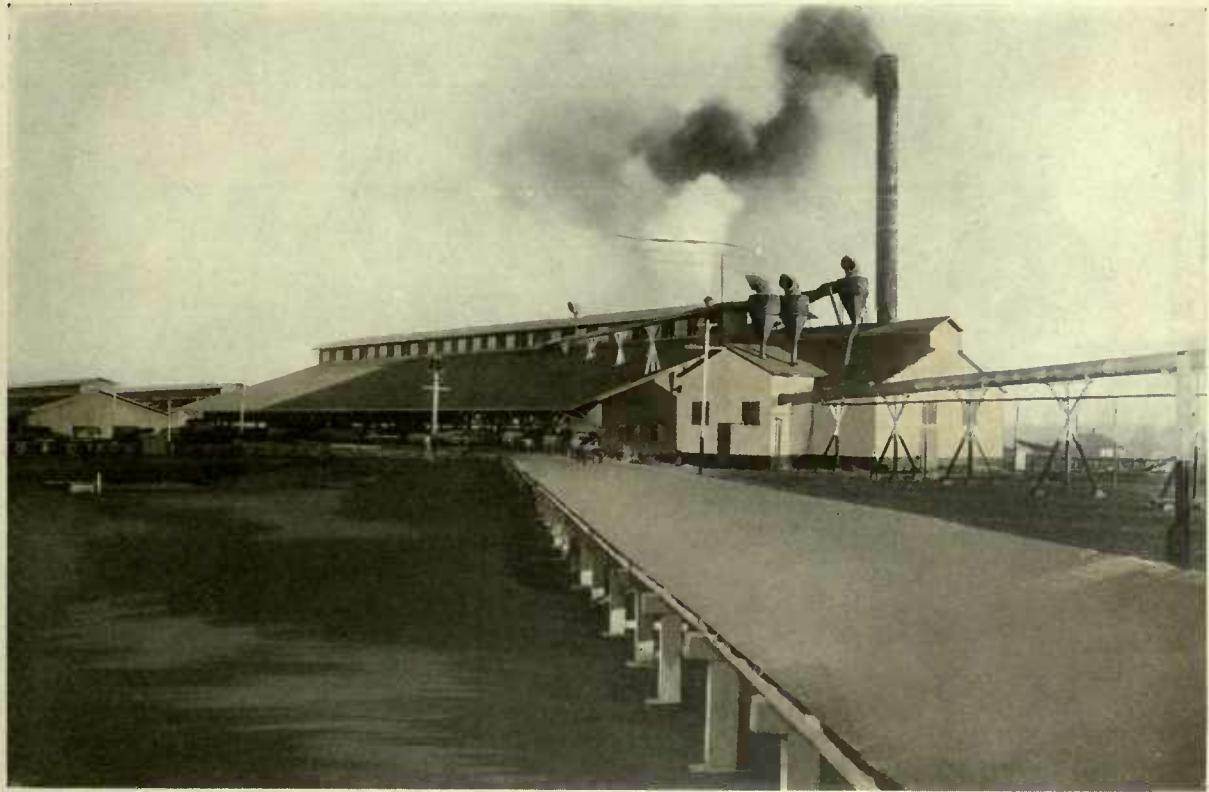
A big planing mill where rough lumber is surfaced and worked into flooring, ceiling, siding, shiplap, and many other forms. Like the sawmills, the planing mills use sawdust and shavings for fuel.



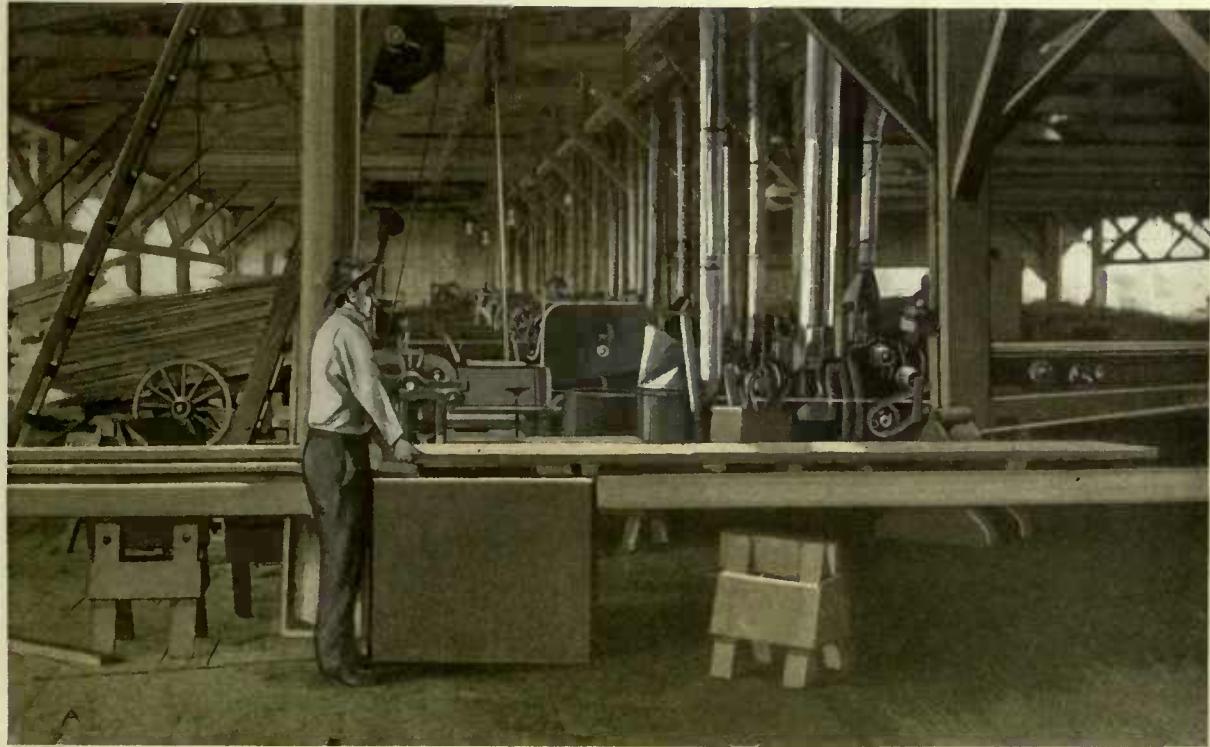
Interior of planing mill, showing lumber in the various stages of manufacture into many forms.



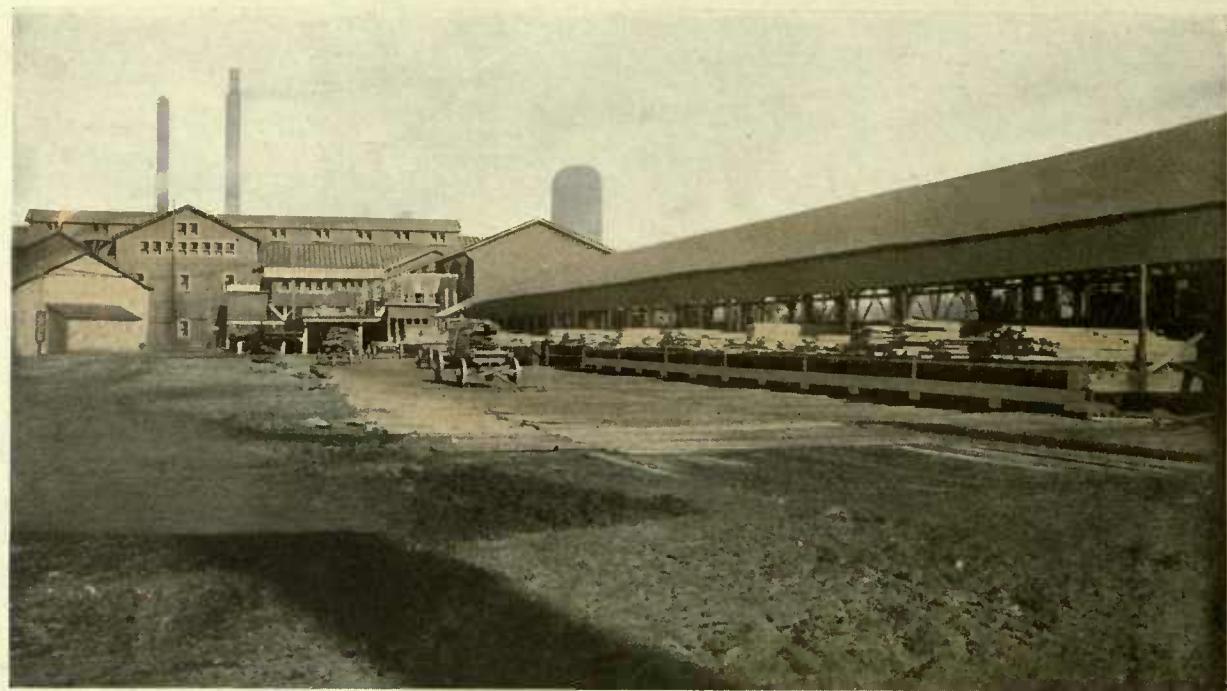
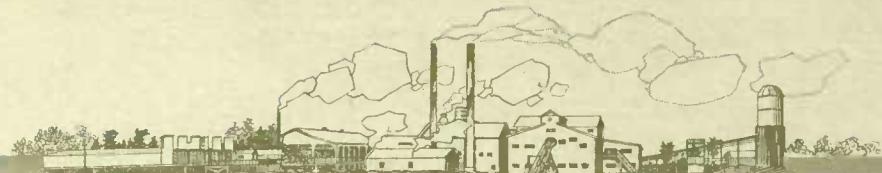
Long-Bell



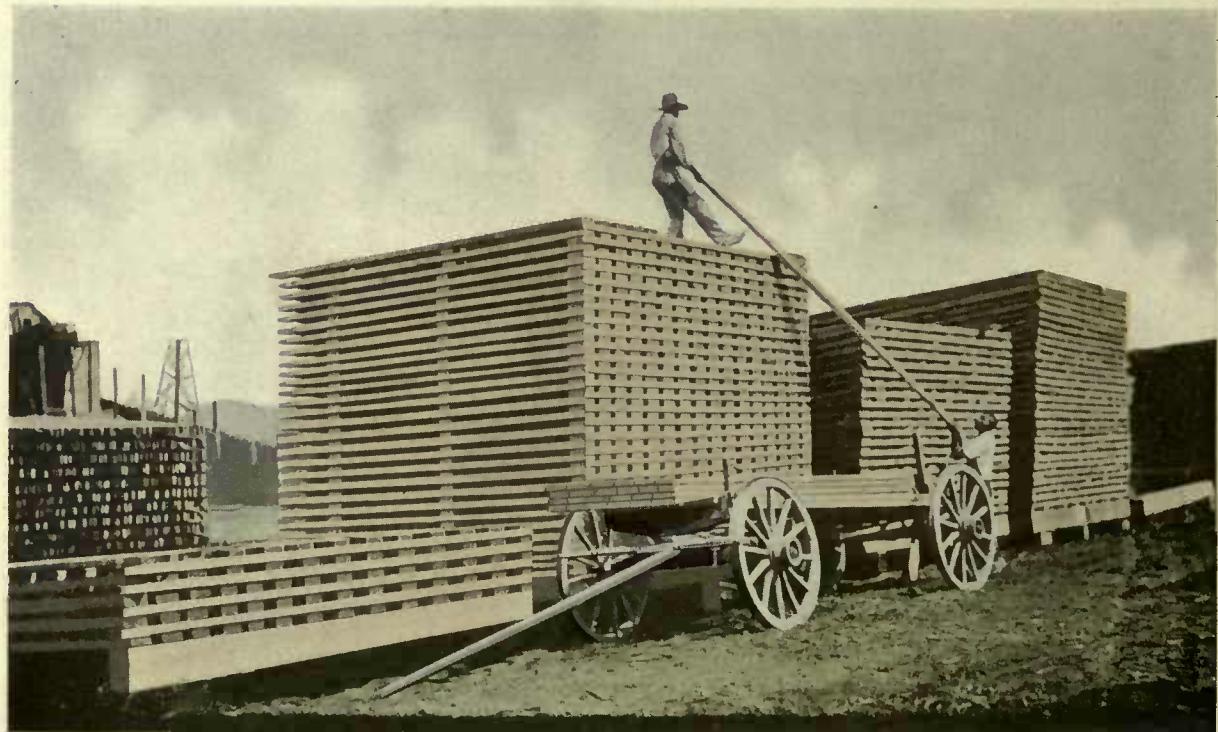
Another of The Long-Bell planing mills where rough lumber is worked into flooring, ceiling, shiplap, siding and many other finished forms for interior and exterior house trim.



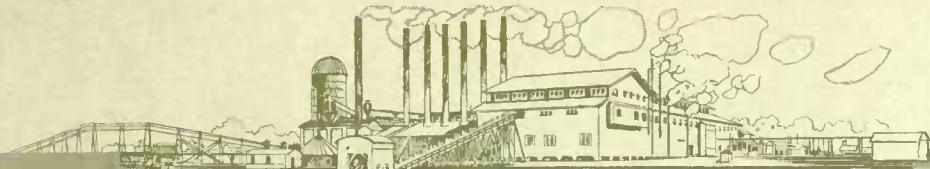
Another view suggesting the complicated character of modern planing mill equipment.



Sorting sheds where green lumber is sorted as to length, width and thickness, preparatory to yard storage.



Lumber on the yard is piled with care and precision, that it may air-dry properly and without injury from the weather.

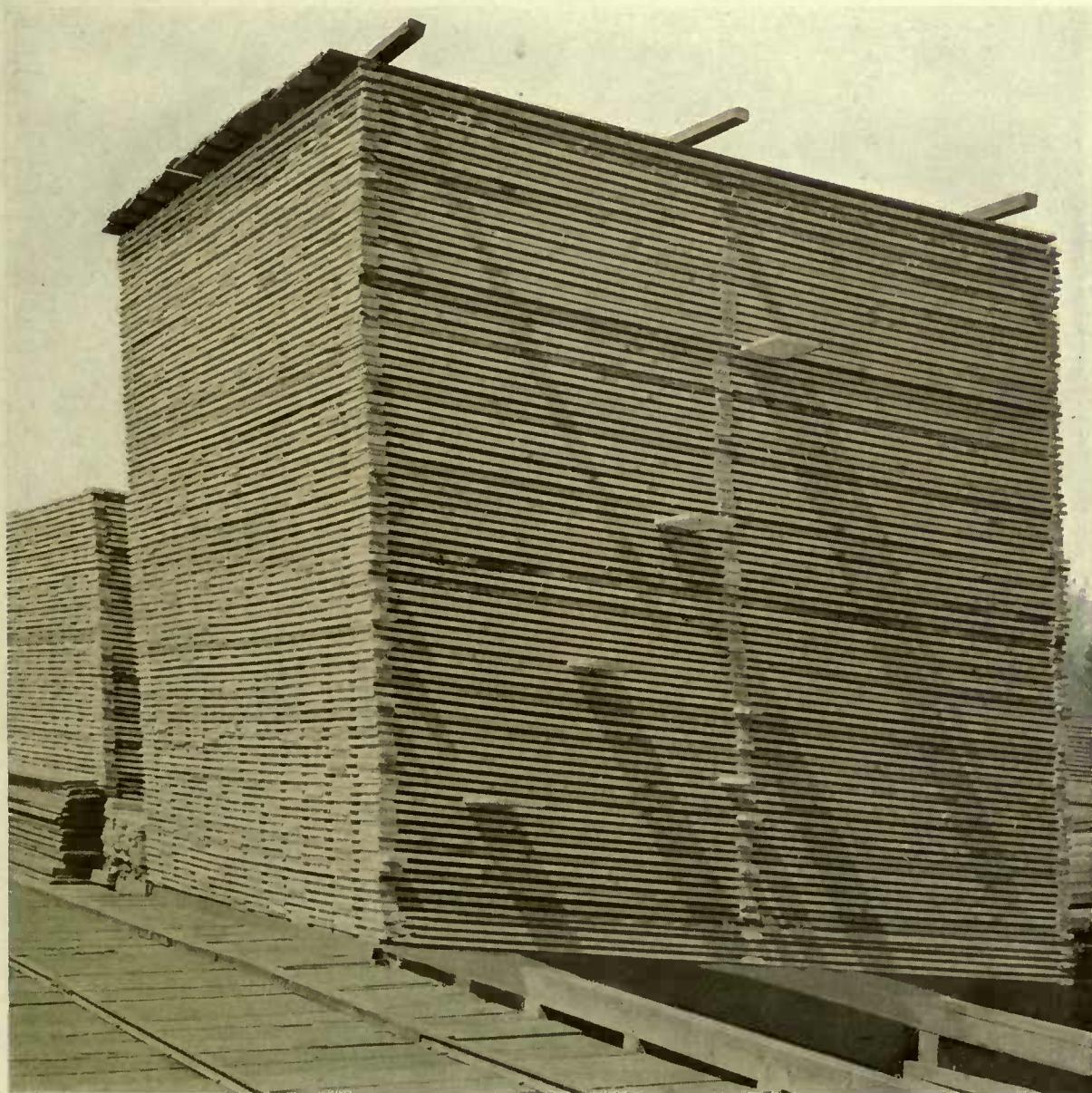


Long Bell

Quality in Lumber

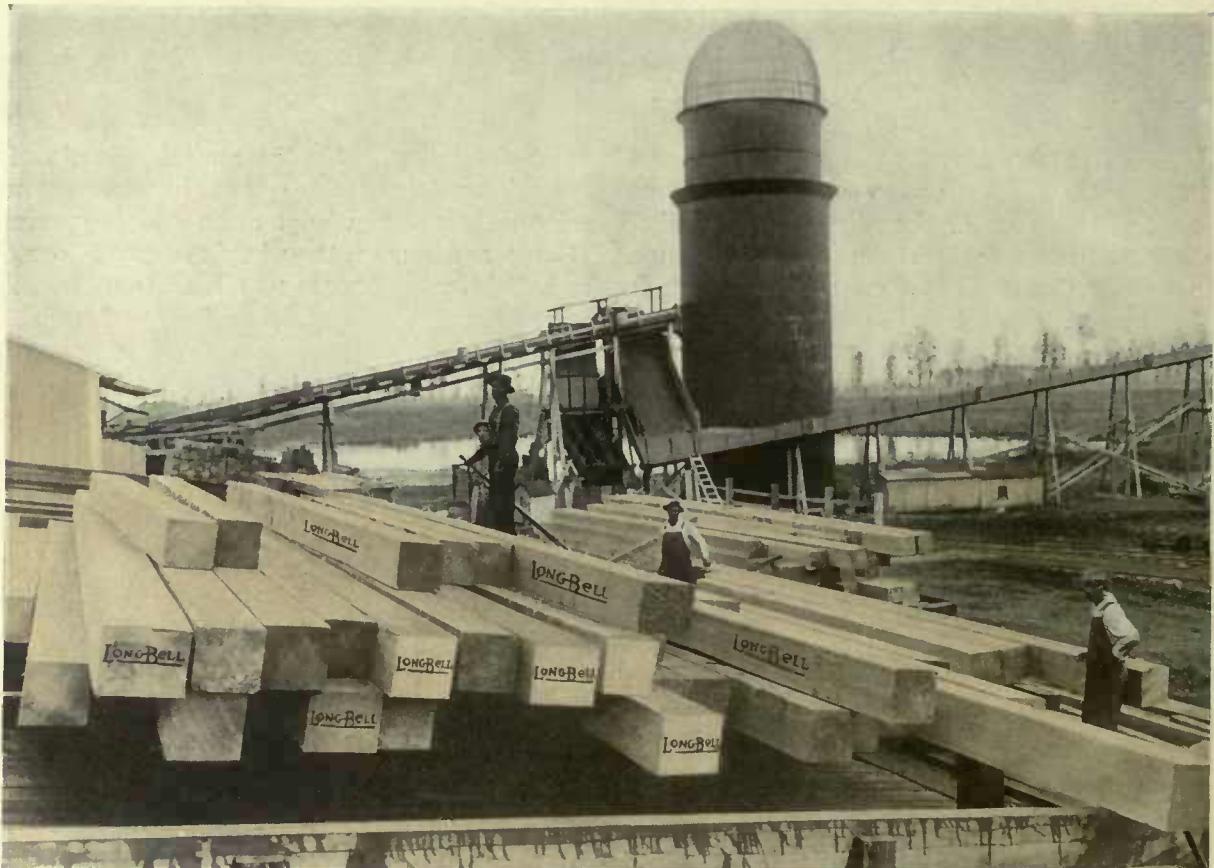
OUR forefathers, when they shouldered their axes and went to the forests in quest of the wherewith to build, exercised far more care and discrimination in selecting material best suited to their needs than most people do in buying building

material today. To the majority lumber is just lumber, and since they have no extensive technical knowledge of its various species, forms and grades, they buy and use it somewhat blindly, trusting to luck that it will serve its particular purpose long and well.

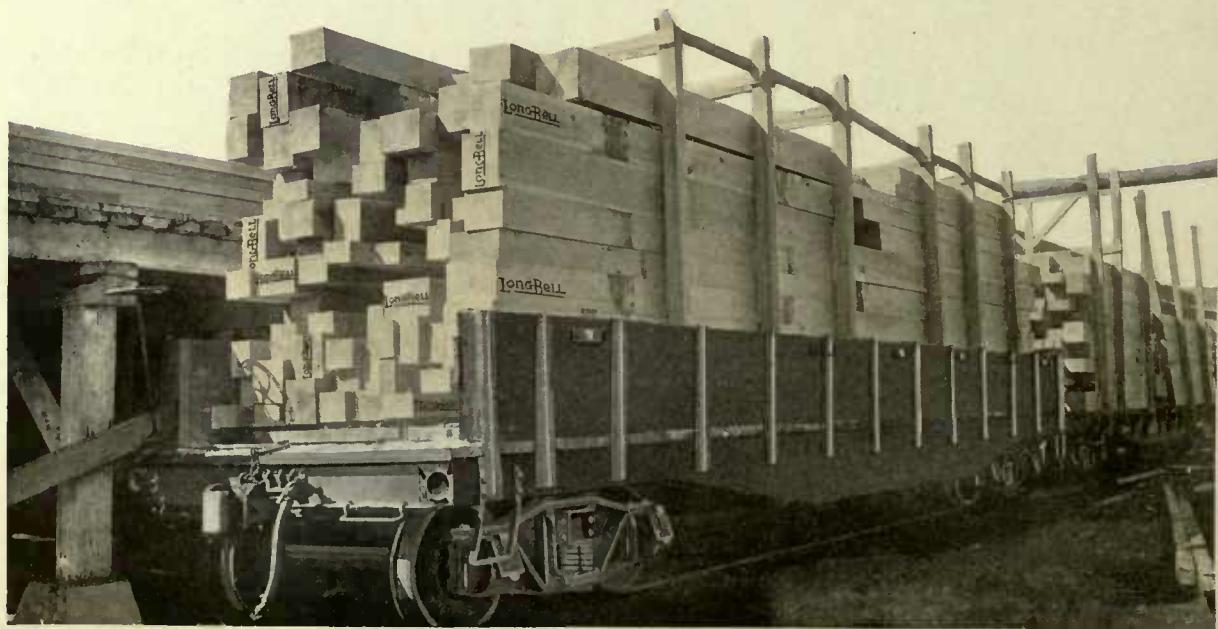


View of a pile of lumber air drying on mill yard.

Long-Bell



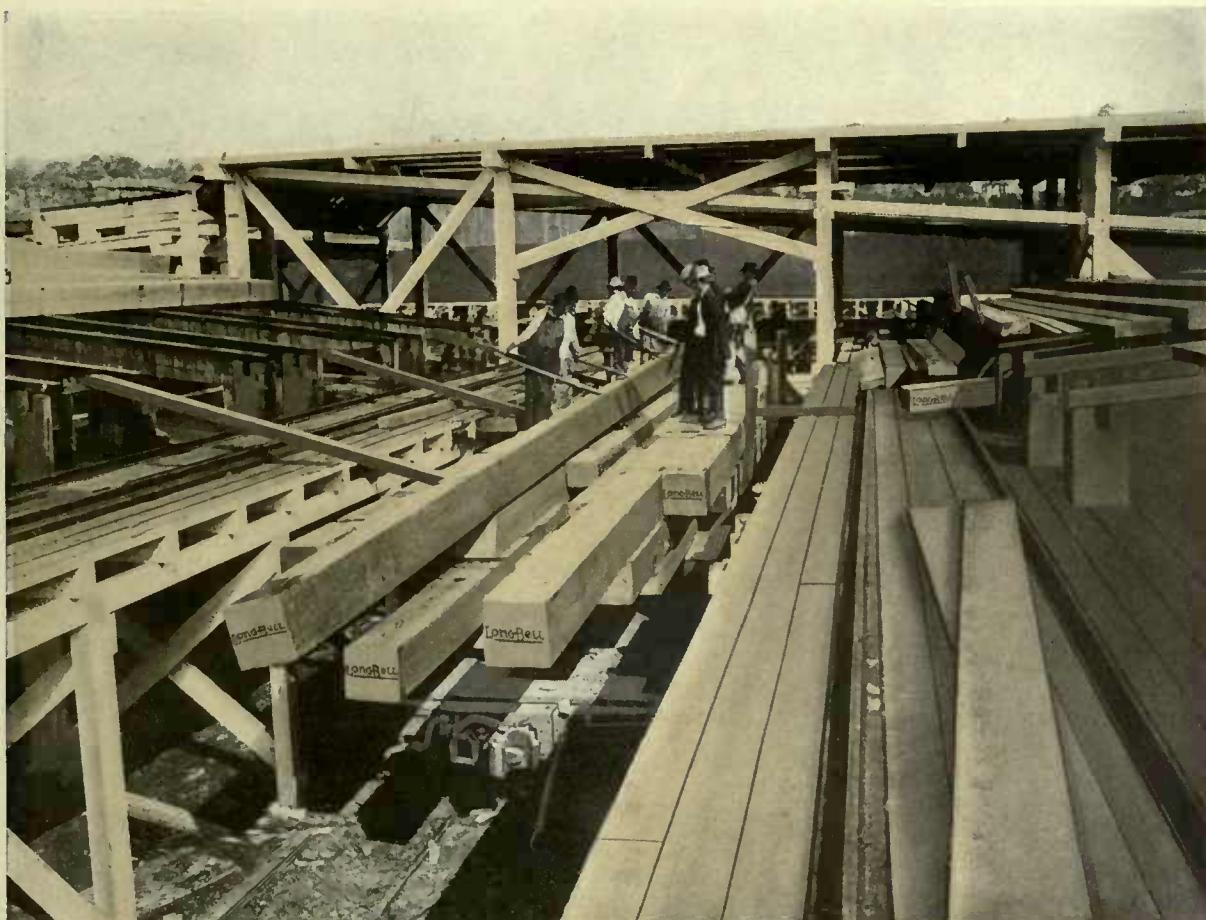
Big timbers, trade-marked and ready for use in many forms of heavy construction, on the sawmill loading docks.



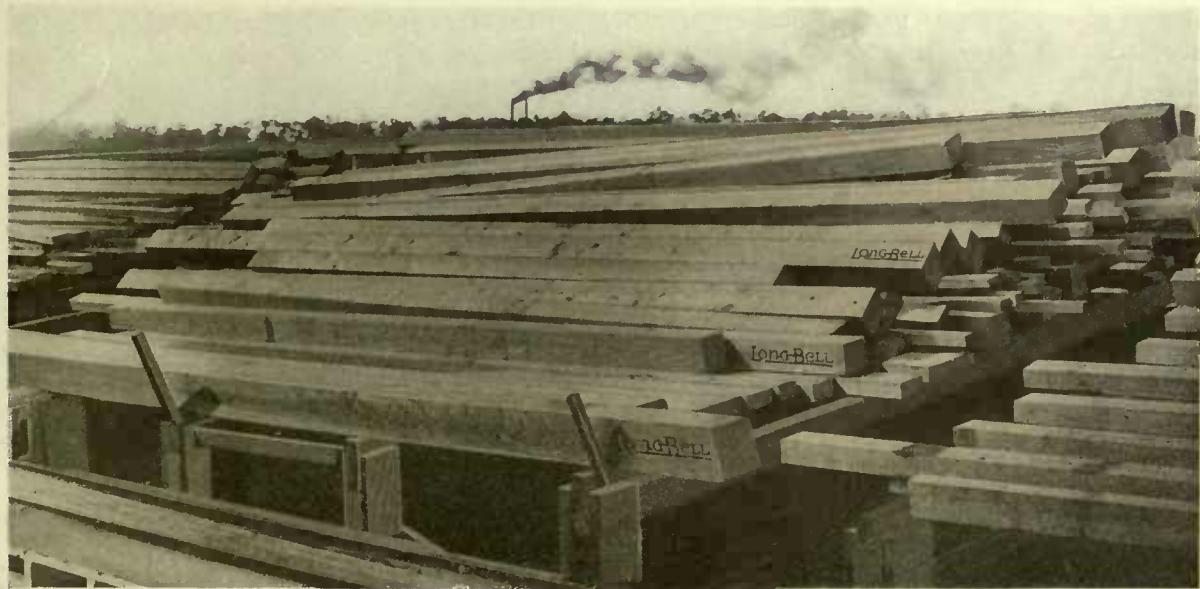
A car of big timbers ready for shipment.



Long-Bell



Loading a big car of Southern Pine Ship timbers, all of them surfaced on four sides.
Several of these timbers are 14 x 14 inches by 50 feet.



Pile of big Calcasieu Southern Pine timbers on dock. The one in the foreground is 14 x 14 inches by 53 feet.

Long-Bell



Loading a car of Calcasieu long leaf Southern Pine timbers.

Enormous sums could be saved American builders if this most valuable structural material were selected and used with the same care that marks the utilization of other important commodities. There are numerous species of wood largely used in building, some adapted to a very extensive and others a

very limited number of uses; there may be a wide variation in quality of lumber of the same species, and there is an important saving in utilizing for any special purpose the grade of lumber best suited to that purpose.

Unfortunately, selection based on actual knowledge of quality is impossible for any



These timber docks have a capacity of 800,000 feet of structural material. This view shows only one side of the docks.

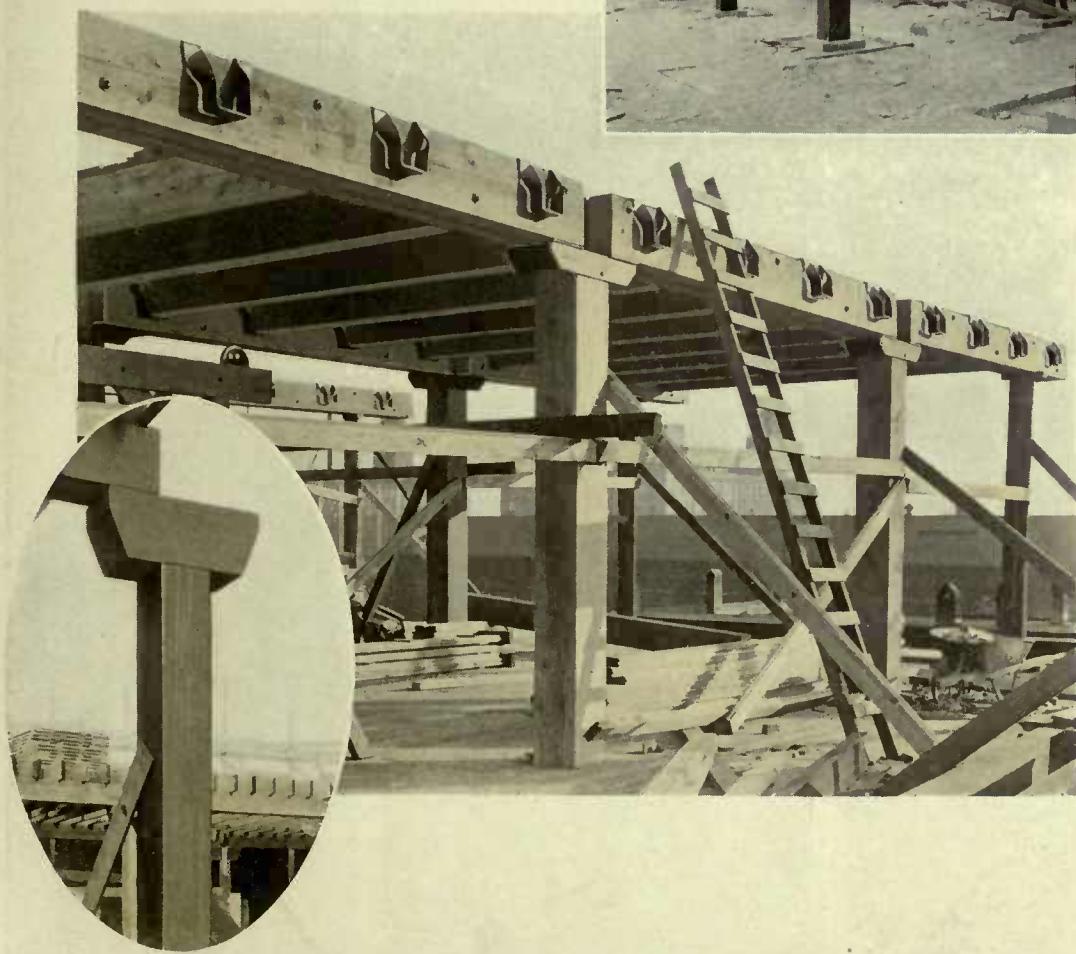


Long Bell

except the specially trained builder, and even he sometimes is unable to make a personal inspection of the material he buys before it is delivered on the job. It is a fact, however, that lumber is being manufactured and graded today more carefully and accurately than ever before, and the buyer who makes certain of his source of supply, and plainly states the intended use of the lumber he requires, may be protected from mistakes in quality and unnecessary expense. It is entirely possible today to obtain lumber which bears the manufacturer's trade mark—this trade mark carrying with it a guarantee of grade and quality.

The species of lumber used far more extensively than any other for general building purposes in the United States is Southern Pine.

This is true not only because Southern Pine is more plentiful and more widely distributed than any other wood, but also because it is adapted to the greatest number of uses. While it is rated as a "soft" wood, its extraordinary strength makes it first choice everywhere for heavy construction, where it is called upon to endure extreme stresses, and for framing in dwellings and similar structures. In addition to its use for general building Southern Pine is consumed in enormous quantities in the



Southern Pine timbers, sound, durable and surpassingly strong, find one of their most important uses in the type of industrial building known as mill-construction. For factories, foundries, warehouses, storerooms, and similar structures, this method of construction is constantly growing in favor.

Long Bell



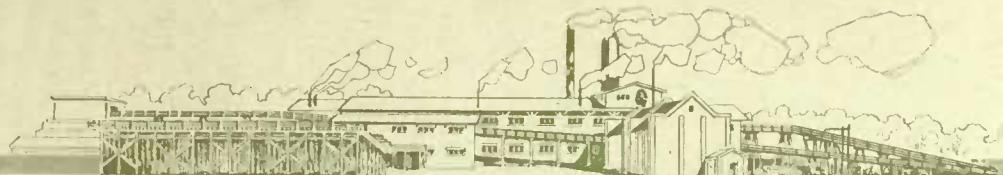
These samples indicate the beautiful and varied grain of Southern Pine lumber. There is absolutely no color or tone effect in perfect, permanent interior finish that cannot be obtained on Southern Pine, at the same time retaining all of the natural beauty in all of the varied grain of the wood.



Southern Pine ceiling.

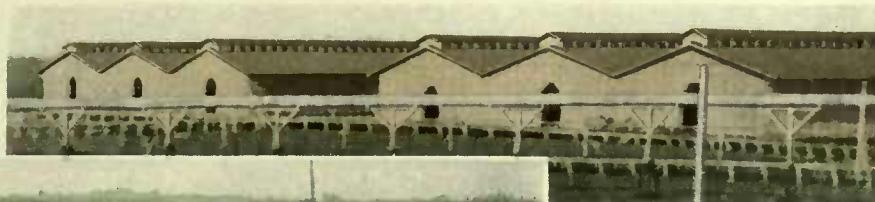
Southern Pine vertical grain flooring.

Southern Pine flat grain flooring.



Long-Bell

manufacture of implements, railway equipment, boats and barges, and more than eighty-



The upper picture shows Long-Bell lumber storage sheds at Longville, La., with a storage capacity of twelve million board feet of lumber. The lower picture shows unseasoned lumber on the "wet end," waiting to go into the dry kilns. Storage sheds in background.

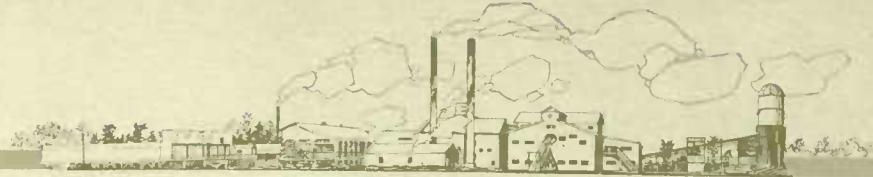
five per cent of all the wood block pavements and floors in America is of that wood.

It is now generally recognized by professional builders everywhere that the strength and durability of Southern Pine used in heavy



Interior of an oak flooring storage shed.

Long-Bell

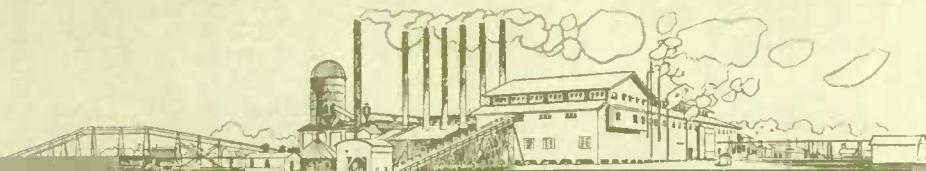


Home of Geo. T. Tremble
Mission Hills, Kansas
City; architect, A. H
Buckley; built by J. C
Nichols

There is no other material that equals wood for home building. It best of all imparts character, individuality and the real home atmosphere.



This Long-Bell forked leaf oak flooring is shown just as it came from the factory. It has not been scraped, waxed or varnished. Note its beauty, even color, remarkably smooth surface.



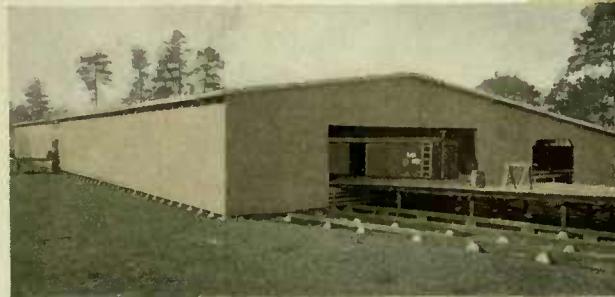
Long-Bell



View of the beautiful ball room of the Hillcrest Country Club, Kansas City, which is floored with Long-Bell forked leaf oak flooring.

construction is determined in a large measure by the density of the growth rings of the trees from which the material is cut. This density may vary greatly in trees of the same species, the locality and conditions of growth have much to do with the physical structure of the wood in individual trees. It is an established

from the Calcasieu district of southwestern Louisiana and from southeastern Texas. The Long-Bell Lumber Company has eight of its thirteen mills in this district, and all these plants specialize in the manufacture of super-grade material for heavy construction. The mills are equipped



fact that much of the densest, and consequently the strongest and most durable, Southern Pine timbers come

Storage sheds containing the higher grades of lumber in flooring, ceiling, siding, finish, etc. Lumber is loaded directly into railroad cars within the shed shown at upper left.



Oak timbers for railroad and other heavy construction work.

to handle readily the largest trees that come from the woods and to produce timbers, either in the rough or surfaced, up to sixty feet in length. These timbers, like other products of The Long-Bell Lumber Company, are trade marked, and select material of this character meets every requirement of the density specifications devised by the United States Forest Service and adopted as standard by the American Society for Test-

ing Materials, the United States Navy, the Southern Pine Association, etc. They are absolutely dependable for use in standard mill construction and for other structural uses where they may be called upon to endure extreme stresses and give hard, prolonged service.

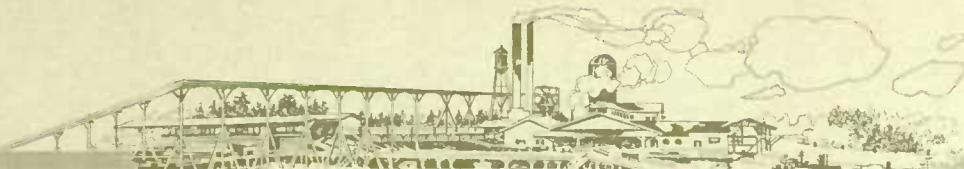
Sales offices and representatives of The Long-Bell Lumber Company are established at various central points in the country, including the home offices at Kansas City, and branches at:

New York City	Oklahoma City, Okla.
Cleveland, Ohio	Pine Bluff, Ark.
Indianapolis, Ind.	Lake Charles, La.
Detroit, Mich.	Dallas, Texas
Chicago, Ill.	Houston, Texas
St. Louis, Mo.	San Antonio, Texas
Memphis, Tenn.	Beaumont, Texas
Lincoln, Neb.	Amarillo, Texas

The lumber products of The Long-Bell Lumber Company include:

Southern Pine Lumber and Timbers.
Creosoted Lumber, Timbers, Posts, Poles, Ties, Piling and Wood Blocks.
Oak and Gum Lumber. Oak Flooring.
California White Pine Lumber.
Sash and Doors, Standardized Woodwork.





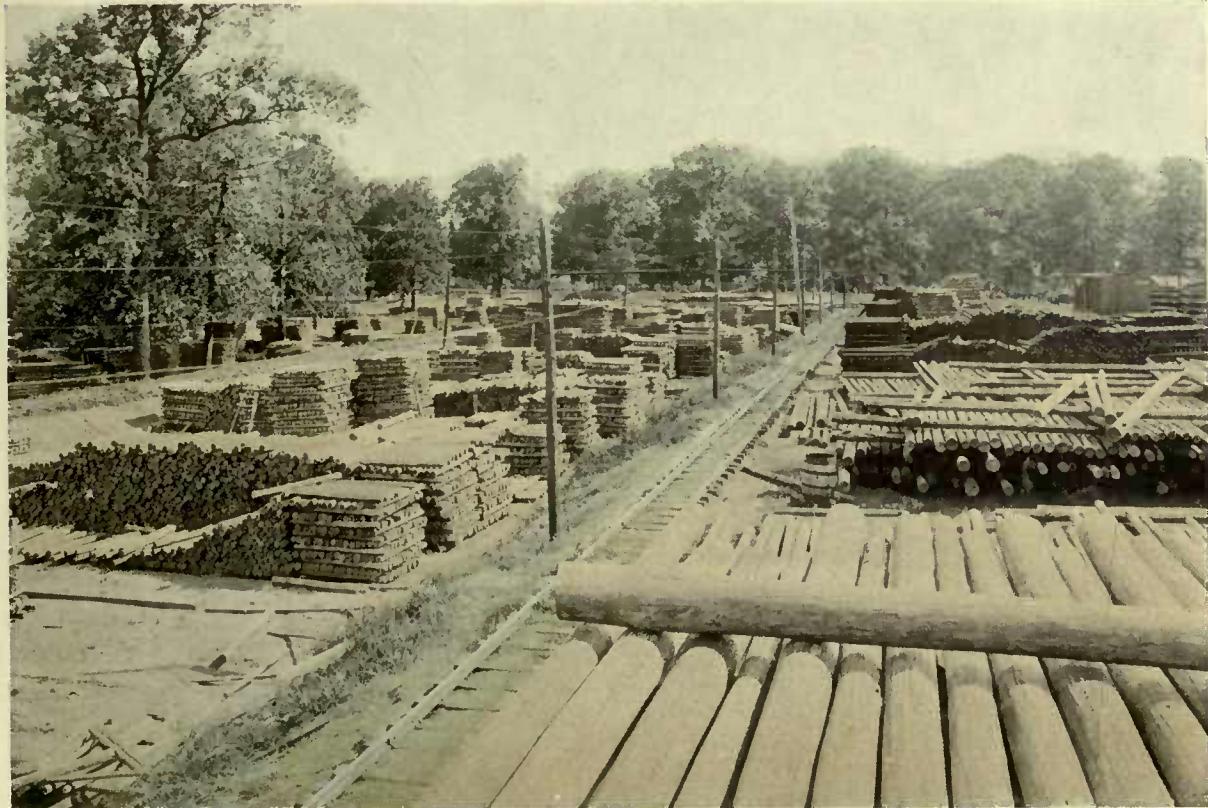
Long Bell

Creosoted Wood Products

THE importance of preservative treatment of structural material for certain uses is now generally recognized, and the use of such treated material is rapidly increasing. This is particularly true of Southern Pine products, because this material is most often called upon to give service in locations where it is particularly exposed to decay or other destructive forces, and because Southern Pine lends itself, more readily than any other high grade structural material, to treatment with preservatives. The Southern Pine products now treated in large quantities include railroad ties, structural timbers, piling, poles, fence posts, wood blocks for paving and for floors, and lumber in any form required.

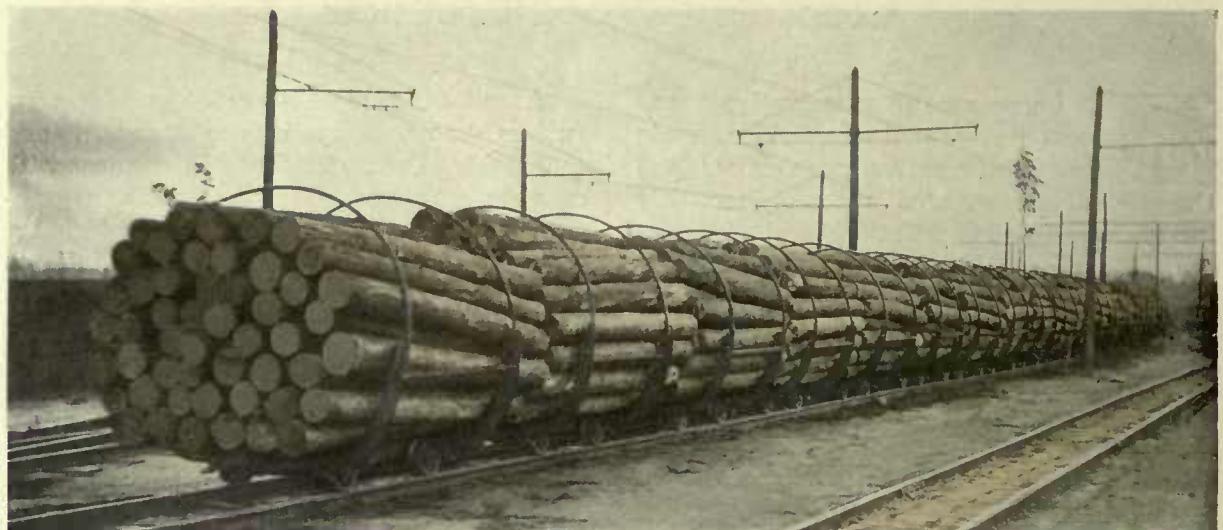
As all experienced users of wood preservatives know, there is one standard and thoroughly effective method of treatment with creosote — that commonly known as the pressure-vacuum process, by means of which the hot creosote (dead oil of coal tar) is injected into the wood under pressure in air-tight retorts. This insures the necessary penetration of the preservative, something that is impossible with brush coating, dipping, or open tank treatments, which are merely makeshifts at best and always uncertain of result.

There could be no better material of its kind than Southern Pine sawmill products, treated with high-grade preservative by the most approved scientific process. Such ma-



Section of post and pole storage yard at a creosoting plant.

Long-Bell



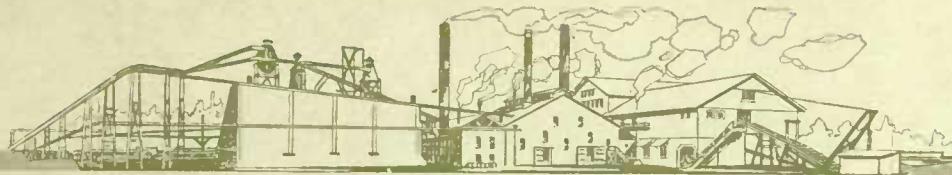
Posts loaded on cars ready for treatment with creosote by the pressure-vacuum process.

terial, sound, sturdy and surpassingly durable, is practically impervious to decay and will finally give way only under stress of mechanical wear.

It is unnecessary to tell architects and engineers that dense Southern Pine is the best material for heavy construction available in quantity and in large sizes. It is also a fact



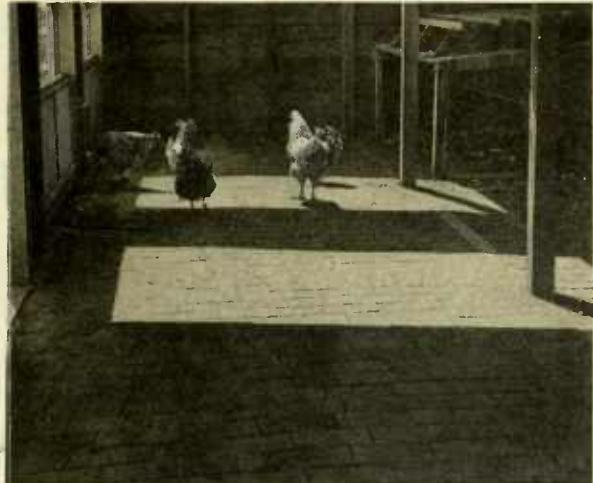
Long-Bell creosoted fence posts, nationally known as "The Post Everlasting," not only make a neat and attractive fence but one that lasts a lifetime.



Long Bell

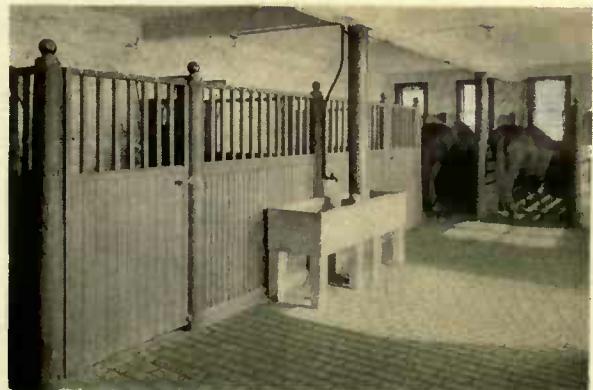


Creosoted wood blocks are a necessary feature of sanitary dairy barns.

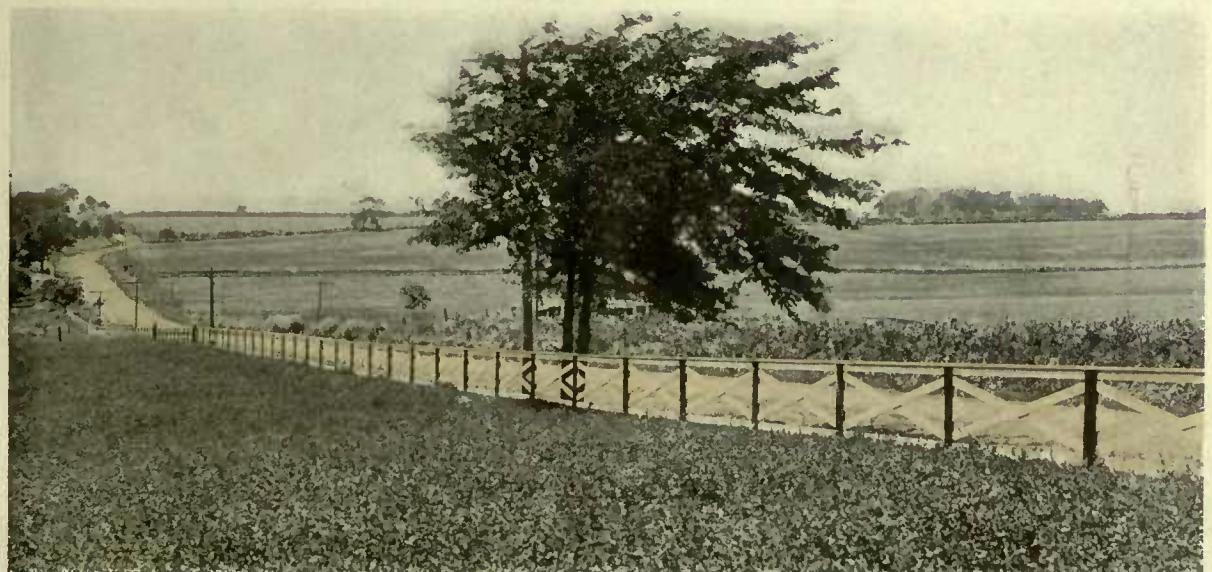


A model chicken house, floored with creosoted wood blocks.

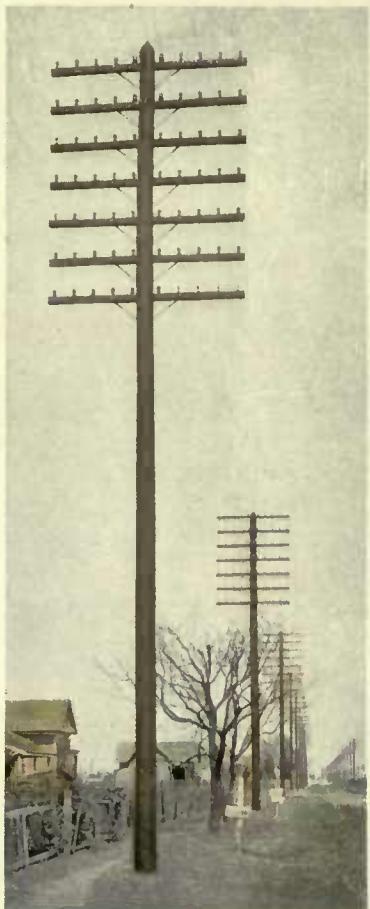
that its qualities of strength are in no degree impaired by preservative treatment. Selected Southern Pine timbers, creosoted, are an incomparable structural material when used in situations where they are exposed to dry rot or other agencies of decay, or where they are subject to attack by insects or marine borers. Southern Pine creosoted wood blocks long since demonstrated their superiority for street pavements and for floors in industrial plants where they are subjected to heavy service. Railway maintenance-of-way officials are unanimous in recommending the use of treated material



Wood blocks provide safe, sanitary and comfortable barn floors.



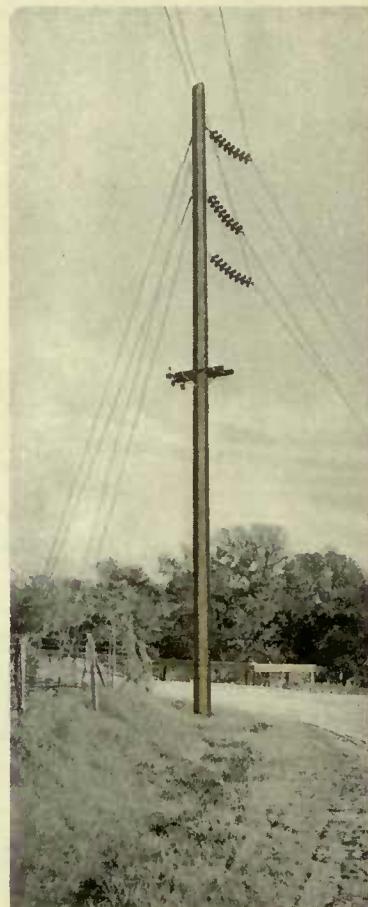
Showing the use of creosoted posts in an ornamental farm fence.



Eliminating pole replacement by using creosoted telephone poles.

for poles, posts, cross-arms, ties, trestles, culverts, station platforms and other exposed places where wood is used.

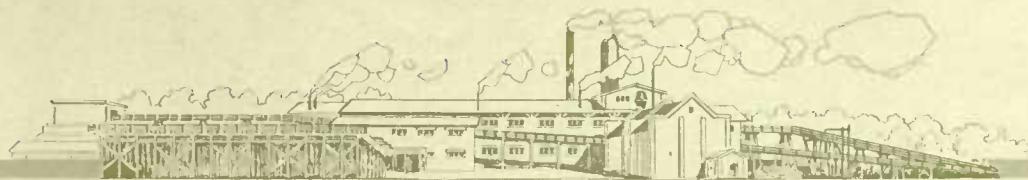
Statistics show that the enormous sum of one hundred million dollars is expended in this country every year in replacing decayed fence posts. The average life of untreated posts of any wood is ordinarily a very few years, as their annual cost of replacement amply proves. Fence posts properly treated with creosote will, on the contrary, last indefinitely—certainly many times longer than any untreated post. Creosoted Southern Pine fence posts in ordinary use on the farm are "permanent" in the sense that they save for the farmer during his lifetime the expense as well as the time and trouble, of fence post replacement.



High power transmission lines carried by creosoted poles.



This fence of creosoted posts indicates a thrifty farmer. He has eliminated replacement costs for many years.

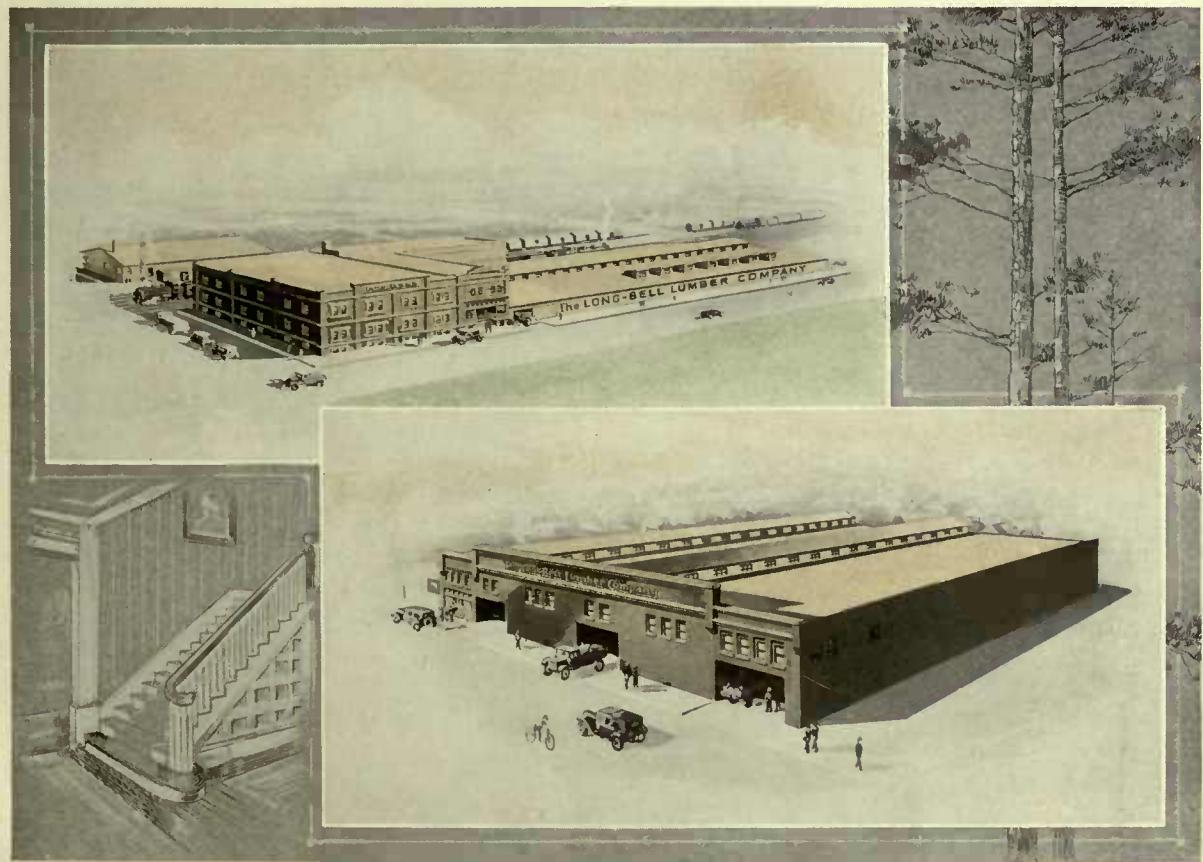


Finished Products From Western Woods

PRIMITIVE methods of earlier days in the lumber industry limited sawmill products to the crudest forms of rough lumber. When it was necessary to work the material into more highly finished forms the work was done by hand labor on the job — by workmen who were cabinet makers as well as carpenters. Today the demand is for lumber highly finished in a multitude of forms, and this demand, combined with the manufacturer's effort to utilize every portion of sawlogs, has tended to develop and improve woodworking machinery and constantly increase the number of sawmill products. An illustration of how a large lumber manufacturing organization today strives to meet

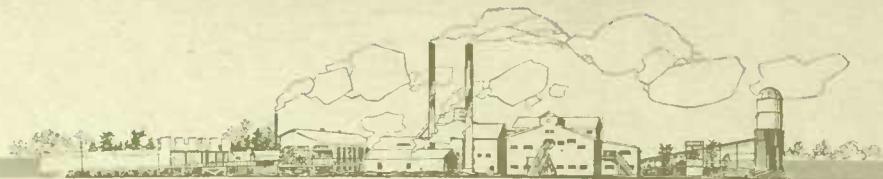
every demand for building material is furnished by The Long-Bell Lumber Company, which not only produces structural material in all the forms usually made from Southern Pine, but also manufactures sash, doors, veneer panels, and box shooks from western woods.

This company's western plant is at Weed, California, picturesquely situated on the western slope of Mount Shasta, three thousand feet above sea level. The plant has a daily capacity of two thousand five hundred doors and three thousand windows, as well as a large quantity of box material and veneers. The timber cut is principally California white pine, with some sugar pine and fir. The large California white pine trees yield a high percentage of the best



Long-Bell sash and door and Standardized Woodwork warehouses carry large stocks, insuring prompt delivery.

Long-Bell



Long-Bell warehouse and distributing center for the company's Standardized Woodwork products at Kansas City.

grades of first and second clear lumber, soft and white and easily worked, and of number one, number two and number three shop lumber. In addition to the material utilized at the plant in the manufacture of sash and doors, shipments are made of finish lumber, common boards, moulding and lath.

One purpose of The Long-Bell Company in adding a line of woodwork to its lumber products was to standardize sash and doors in a limited number of designs, so that they might be stocked and sold effectively by the retail lumber dealer. The tendency in recent years has been to manufacture a constantly increasing number of "special" sizes and designs in sashes and doors, which made it so difficult for the retail dealer to carry stocks of such material that he was practically eliminated from this branch of the business.

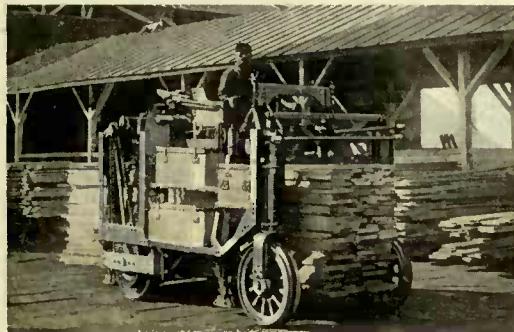
The standardizing of woodwork designs not only means lower costs all the way from the manufacturer to the consumer, but better quality. It is an established fact in large woodworking plants that with the larger production of a limited number of designs come higher average quality through increased efficiency of labor and economy of operation. And when the retail lumber dealer is able to stock these standard sizes in sash and doors, it is just that much easier for the lumber consumer to obtain the material he requires in building.

To facilitate distribution and prompt delivery The Long-Bell Company has established stock warehouses at the factory at Weed, Kansas City, and other centrally located distributing points.





Long-Bell



An electric lumber carrier.

American Lumber in Foreign Countries

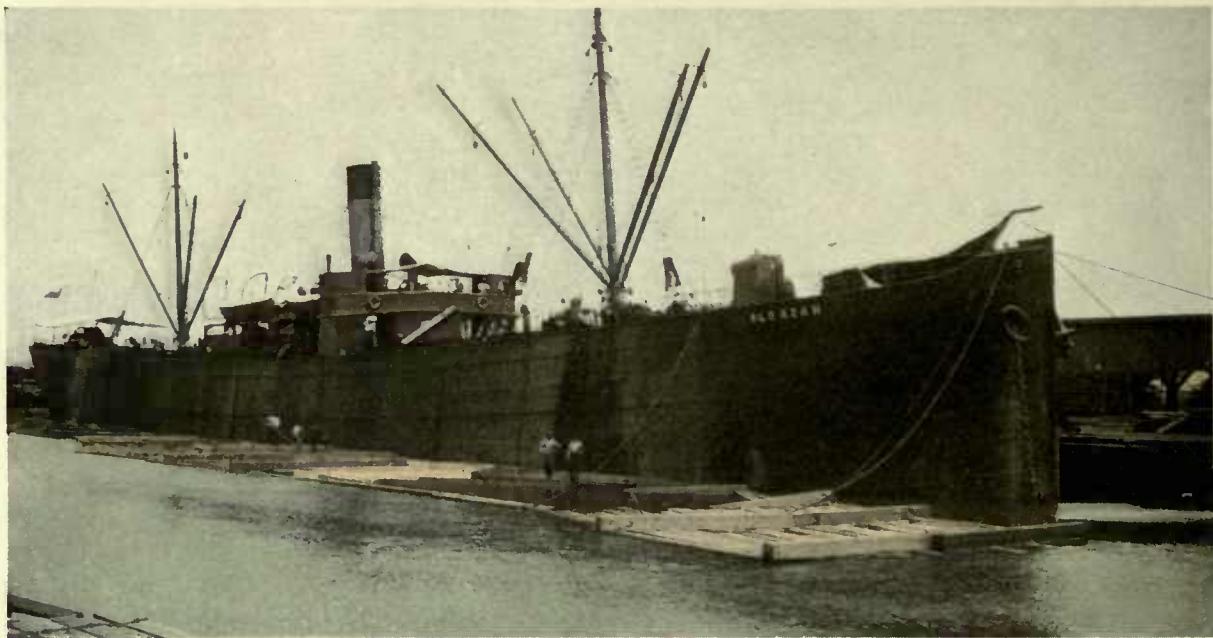
AMERICAN lumber is esteemed in foreign countries as highly as it is at home, and there is an insistent and constantly growing demand for this material in England and Continental Europe, Africa and South America. Because of the scarcity or inferiority of native woods in many foreign countries, lumber is used much less in dwelling house construction than it is here, but American forest products, especially those of Southern Pine, are required for many other

important uses. In fact, Southern Pine is employed extensively in Europe for purposes unusual in this country—notably for the manufacture of highly finished furniture. The superior qualities of Southern Pine timbers in all types of heavy construction are as well known abroad as at home, and it is universally used for such requirements.

The export business of The Long-Bell Lumber Company is principally with England, Holland, Belgium, France and Italy. A few



Export timber booms at a Southern Gulf port.



The steamer "Alcazar" loading cargo of Long-Bell timbers at Port Arthur, Texas, for export.

shipments are made to South Africa. The practice of trade marking Long-Bell export material has been in effect several years, so that this brand is thoroughly established abroad.

Standard timber and lumber sizes differ from those of this country, so that export material must be specially cut. Special equipment for shipping material in large quantities also is required to take care of export

business. About ten days are required to load an average steamer cargo. Vessels are loaded by contracting stevedores, the ships supplying the hoists and power required for loading. Products of The Long-Bell Lumber mills are shipped from a number of Southern Gulf ports.

The Long-Bell Company's normal capacity production for export is seventy to eighty million board feet annually.



A Southern Pine forest highway.



Long-Bell



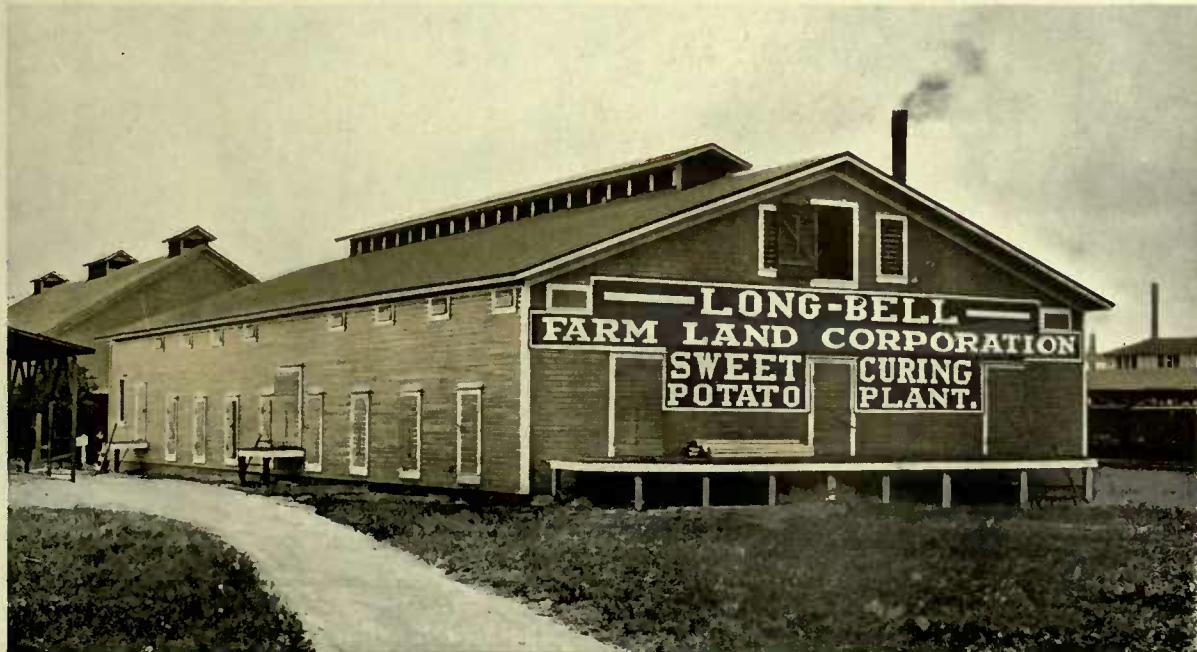
Long-Bell cut-over lands offer remarkable opportunities for stock raising.

Farm Lands in the Wake of the Woodsman

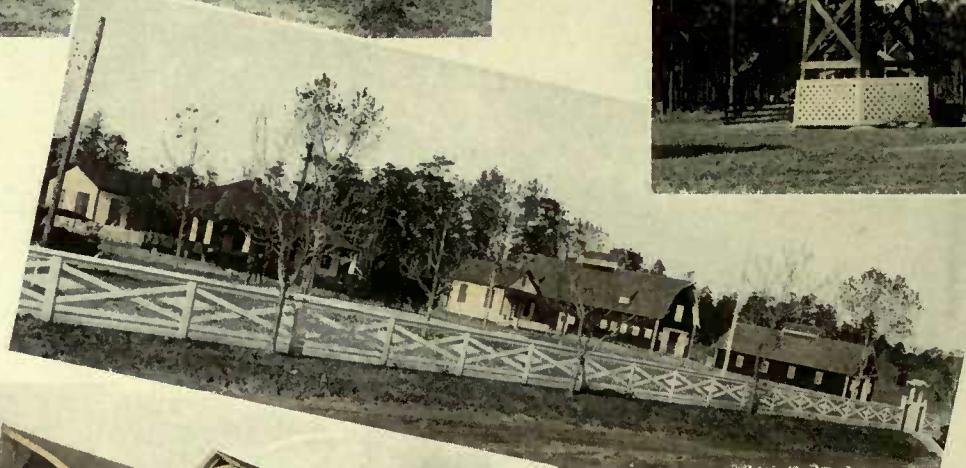
WHEN the timber cruiser, advance agent of the lumber manufacturer, first surveyed the vast areas of Southern Pine forests he had an eye only for the towering trees and their value as raw material for the manufacture of lumber. The ground from which these trees grew so majestically was considered only with regard to the ease with which logging operations might

be carried on. That this ground, when cleared of the forest growth, might some day be converted to agricultural uses was a prospect too remote to enter into his calculations; this to him was timber land and nothing else.

The same disregard of the land, as land, for a time characterized the attitude of the lumber manufacturer. He erected sawmills, created towns and villages, established section lines



This sweet potato curing plant, De Ridder, Louisiana, provides a cash market for the crop grown by new settlers.



Farm buildings and live stock on a Long-Bell Demonstration Farm.

through the woods, built wagon roads and railroads—but all his activities were directed toward the end of facilitating lumbering operations. But as logging operations progressed the extent of "cut-over" land inevitably increased, and with its increase grew the problem of what useful purpose this denuded territory might best be made to serve. The lumberman was no agriculturist, but he realized that the ultimate destiny of these rapidly accumulating acres of cut-over land was their development as farms—provided the soil

was capable of supporting animal life and producing profitable crops.

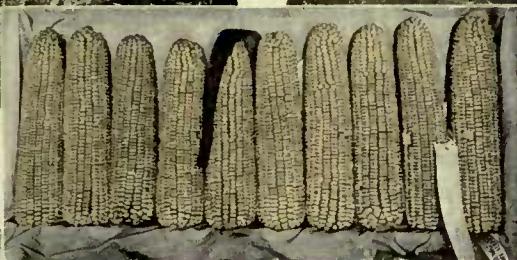
The Long-Bell Lumber Company, in its extensive and long continued lumber operations, has in the course of years cleared standing timber from great tracts of these lands. And many years ago the company began to give thoughtful consideration to the possibilities for agricultural development of the cut-over region. The problem involved was principally that of determining the quality of the soil—its fertility or lack of it. As to climatic



Japanese ribbon cane.



An oats field.



(Upper) Prize Louisiana corn.



(Left) A Louisiana Highlands corn field.



Dairy herd.



Pure bred hogs.



Sheep ranch.

conditions there was no question. The greater portion of the Long-Bell holdings was in a latitude where there was no winter as it is known in the North, where vegetable growth continued the year 'round, where native

grasses furnished plentiful pasturage eight or nine months of every twelve, and where the annual rainfall was abundant and well distributed through the seasons. Throughout the region there were never-failing streams of



Scene on a Shorthorn Ranch, developed from cut-over land near DeRidder, Louisiana.

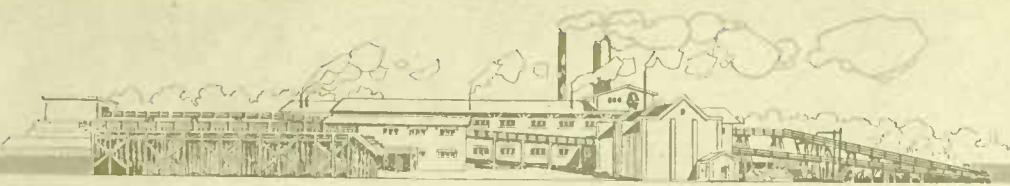
clear, pure water, and it was found that the best of well water could be had at a depth rarely exceeding sixty-five feet. The land for the most part presented a gently rolling surface, naturally well drained, free from stones and stubborn undergrowth, and the soil was a friable loam that would readily lend itself to cultivation. If this soil contained the plant food necessary for profitable farm crop production, this seemed an ideal region for stock raising and general farming operations.

That there might be no "guesswork" concerning this question of soil quality, The Long-Bell Lumber Company undertook, more than a dozen years ago, exhaustive practical tests in various branches of agriculture on the cut-over lands. Hundreds of acres were cleared of stumps left standing after the logging operations, the land thoroughly tilled, and a great variety of crops planted. The crops produced included corn, oats, cotton, cane, a variety of legumes, vegetables, berries, grapes and tree fruits. In addition, careful study was given to the rearing of live stock, and records kept of the cost as compared with that in northern states, of bringing beef animals, hogs and sheep to a marketable condition.

As a result of this practical demonstration

work there no longer is any question as to the adaptability of the Long-Bell cut-over lands for general farming purposes. Not only has the company's demonstration work amply proved this, but in recent years abundant additional evidence has been furnished by northern and western farmers and stock raisers who have purchased farms and ranches in the Long-Bell district, and who are now contented and prosperous in the homes they have established there.

Extensive tracts of the Long-Bell cut-over lands are now open to purchase by farmers and stockmen on easy terms, and at prices that are ridiculously low as compared to present-day land prices in the older and more densely populated agricultural communities of the North and Middle West. With the natural advantages of climate, unfailing water supply, abundant rainfall, good soil and the proximity of markets and transportation facilities already established, this region is destined quickly to develop into one of the great agricultural and stock producing sections of the country. Today it offers possibilities to the seeker for productive acres at low cost believed to be unequaled elsewhere in the entire country.

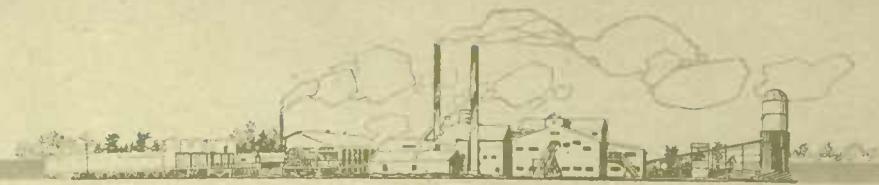


Long-Bell



ROBERT A. LONG
Founder and President of The Long-Bell Lumber Company.

Long Bell



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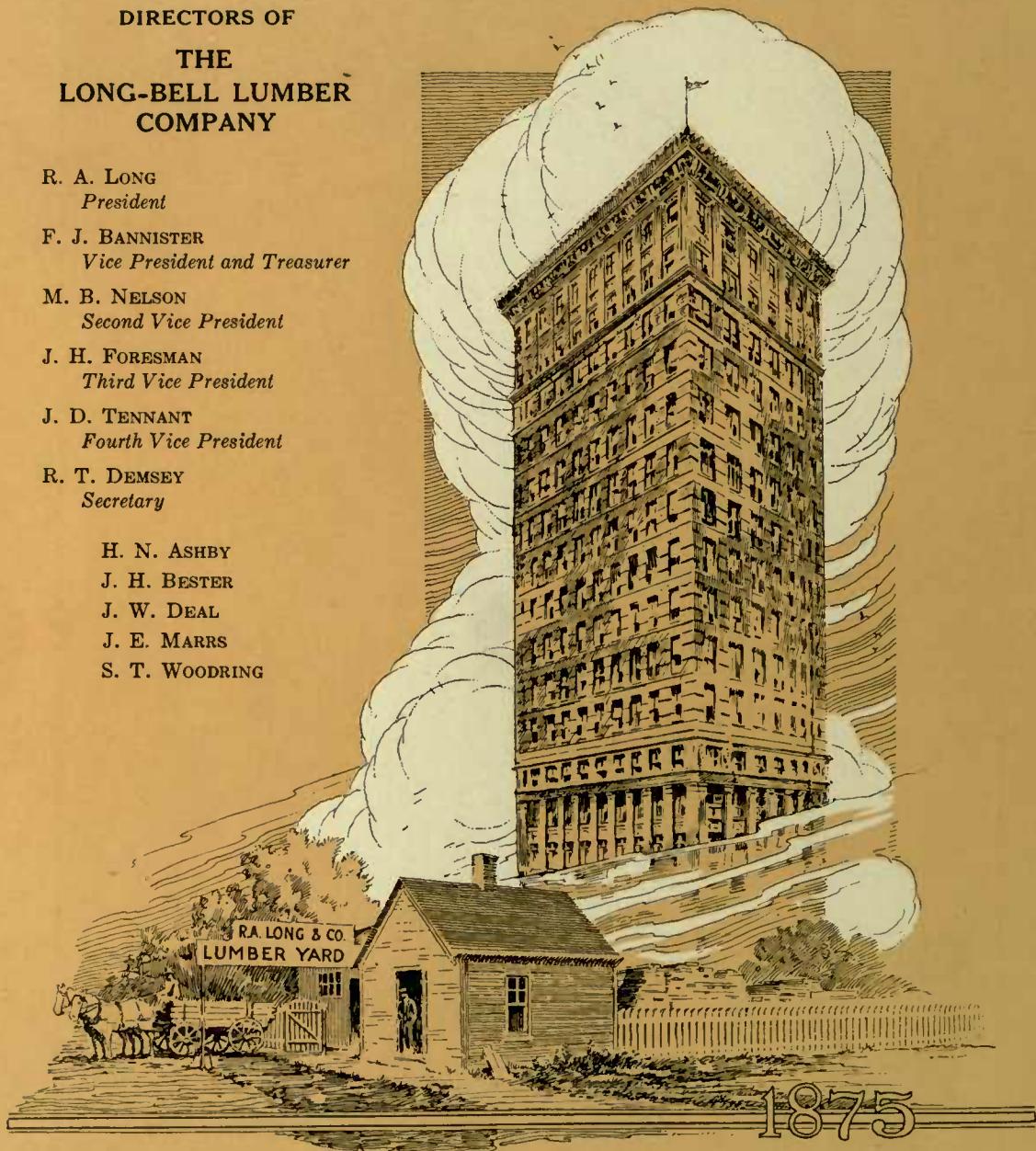
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